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SYMPOSIUM HELD AT THE GUILD INN,
TORONTO, CANADA, AUGUST 12-16, 1985

ALCOHOL- RELATED CASUALTIES

Edited by

NORMAN GIESBRECHT

HONEY FISHER

NIAAA

National Institute on Alcohol Abuse and Alcoholism



ADDICTION RESEARCH FOUNDATION



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ADDICTION RESEARCH FOUNDATION
Toronto

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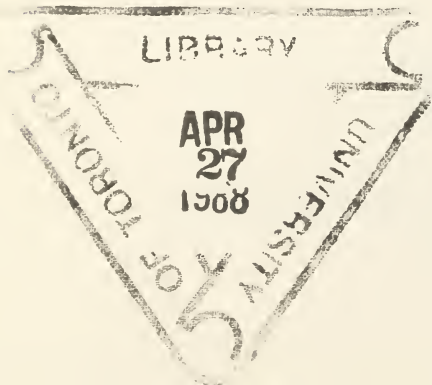


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Preface

Casualties have a tremendous impact both on a personal and on a social level. Each serious injury or death due to an accident, poisoning, or violent incident involves personal anguish. Casualties also disrupt family and work life, and the productivity of the social unit. They reduce life expectancy. For younger age groups, casualties are the leading cause of death and years-of-life lost.

While there are many contributory causes of accidents, poisonings, and violence, alcohol is increasingly acknowledged as having a significant role in these events. Alcohol-related casualties may be accidental, self-inflicted, or other-inflicted complications related to alcohol consumption. Research and prevention initiatives are well established with regard to alcohol-related casualties involving motor vehicles. Furthermore, a broadening circle of research and prevention policies and programs are evident for other types of casualties as well. Industrial, recreational, public transportation and home accidents, and casualties related to poisonings and violence, are included in the expanding foci of research and prevention initiatives.

For some countries, particularly developing ones experiencing rising rates of alcohol consumption, alcohol-related casualties may be a more visible indicator of damage, and perceived to be among the more pressing concerns.

The emphasis that casualties receive in the alcohol literature is probably not comparable to the substantial contribution of casualties to disruption among heavy drinkers and social life in general. In social and epidemiological contexts, the post-war literature seems to have been dominated by interests in chronic conditions, and emphasis that, in turn, reinforced a focus on the dependent and older drinkers who were likely to experience liver cirrhosis and other ailments associated with heavy consumption. This body of work has been of tremendous interest in its own right and also a basis for major conceptual advances in such areas as the relevance of the volume of alcohol intake, continuum models in understanding the social aspects of dependence on alcohol, and the impact of alcohol policy on all sectors of the population including heaviest consumers.

A keen interest in the alcoholic or dependent drinker continues, and a number of issues dominate the field including the nature and types of alcohol addiction, predisposing situational or genetic characteristics, early signs of alcohol dependence, the impact of alcoholism on others, and biomedical and other interventions. Considering the foci in the alcohol field generally, and the dominant orientations vis-à-vis the alcoholic, it is not surprising that traumatic morbidity or

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mortality events, especially those involving younger non-dependent adults, have not received much attention.

The area of alcohol-related casualties was and still is underdeveloped both in terms of the collection of routine information for monitoring and analysis, and also in the identification of the role of alcohol in various casualties. Despite the limitations of current information with regard to alcohol and casualties, this topic is nevertheless of considerable political relevance, for a substantial part of the societal burden of alcohol problems involves casualties.

Therefore, in terms of both research potential and prevention programming, the field of alcohol-related casualties is a promising one. It is hoped that through innovative studies and the adoption of environmental controls, as well as community-based, institutional, or personal strategies, the world can be made safer for both drinkers and non-drinkers.

These proceedings represent an overview of the International Symposium on Alcohol-Related Casualties. The symposium was oriented toward several complementary agenda: documenting and reviewing the state of the field; identifying major conceptual and data collection issues including the utility, comprehensiveness, and limitations of aggregate statistics on alcohol-related problems; providing examples of what can be done in assessing the situation at various institutional levels; offering exemplary studies documenting alcohol-related casualties; and pointing in the direction of future independent and collaborative research and policy initiatives.

In order to capture such a broad orientation, it was important that a meeting offer a number of substantive topics in the same general area, as well as provide an exchange of a wide range of disciplines and experiences represented by the participants. The international perspective was instrumental in raising the level of awareness of variations in information and issues between developed and developing countries and in provoking a wider exchange of ideas. Discussions in a number of agencies and organizations led to multiple sponsorship of the symposium. This facilitated the invitation of participants and ensured an international as well as an inter-disciplinary flavor.

Consequently, we hope that this book will be of interest to professionals from many disciplines and positions, including those working in such areas as trauma, prevention, policy planning, medicine, epidemiology, public health, hospital administration, archival data and official statistics, clinical testing and measurement, and sociocultural studies of alcohol-related problems. In addition to researchers and clinicians, it is expected that policy-makers, administrators of public health programs, social service workers and others will find the book of interest.

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We hope that this report will make some contribution not only to improving our understanding of how to go about conducting better research in this area, but also to our interpretation of what this research tells us, and that this new knowledge, in turn, becomes a major resource in pointing to policy actions that should be undertaken locally, regionally, and nationally to curtail injury and death related to traumatic events.

A number of organizations were involved in the planning and coordinating phases of this symposium. The Addiction Research Foundation hosted the meeting. The sponsors included the Addiction Research Foundation, Health and Welfare Canada, the U.S. National Institute on Alcohol Abuse and Alcoholism, the World Health Organization (Geneva), and the Pan American Health Organization. A number of other agencies and institutions also contributed to the meeting's success by sending participants.

Representatives from a number of agencies contributed to the symposium by participating in planning meetings, developing the agenda and selecting the papers and participants. Preparations for the symposium were facilitated by contributions by the following individuals:

Manuella Adrian, Honey Fisher, Norman Giesbrecht, John Macdonald, Joan Marshman, and Wolfgang Schmidt from the Addiction Research Foundation (Toronto, Canada);

Robin Room from the Alcohol Research Group (Berkeley, California, U.S.A.);

Ron Draper and Irving Rootman from Health and Welfare Canada (Ottawa, Canada);

Maria Elena Medina Mora from the Mexican Institute of Psychiatry (Mexico City, Mexico);

Henry Malin, Robert Niven, and Leland Towle from the National Institute on Alcohol Abuse and Alcoholism (Rockville, Maryland, U.S.A.);

Enrique Madrigal from the National Institute for the Prevention of Alcoholism (San José, Costa Rica);

René González from the Pan American Health Organization (Washington, D.C., U.S.A.);

Esa Österberg from the Social Research Institute of Alcohol Studies (Helsinki, Finland); and

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Marcus Grant, Walter Gulbinat, and Norman Sartorius from the World Health Organization (Geneva, Switzerland).

A steering committee consisting of Norman Giesbrecht (chairman), René González, Marcus Grant, John Macdonald, Esa Österberg, Robin Room, Irving Rootman, and Leland Towle assumed responsibility for final preparations for the meeting.

N.G. & H.F.

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In addition, we thank staff of the Foundation's Administrative and Educational Resources Division, for their contributions to the symposium. The Social and Biological Studies Division supported the meeting and the reports arising from it.

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Special thanks are in order to members of the steering committee for the symposium: René González, Marcus Grant, John Macdonald, Esa Österberg, Robin Room, Irving Rootman, and Leland Towle. Their contributions to the planning of the meeting, coordination of various activities, and suggestions in the course of preparing this book are gratefully acknowledged.

Introduction

Norman Giesbrecht and Honey Fisher

The International Symposium on Alcohol-Related Casualties was organized with a three-fold purpose in mind:

1. To review existing and alternative systems of recording and analysing statistics on alcohol-related casualties, in order to better promote the development of methods to improve the assessment of the role of alcohol in casualties;
2. To assess the current state of knowledge about the prevalence of alcohol-related casualties and their etiology in order to develop specific research strategies and proposals; and,
3. To identify ways in which knowledge of the role of alcohol in casualties can be used more effectively in the development of appropriate policies and programs.

In line with these purposes, there were several questions that were examined:

What do we want to know about alcohol-related casualties from both the researchers' and policy-makers' perspectives?

What does the current literature from both developing and developed countries tell us about the causal role of alcohol in casualties?

How are casualty statistics generated in various reporting systems and how are alcohol-related problems defined in different cultural settings?

What conclusions can be drawn from specific data sets on the role of alcohol? How are these conclusions relevant to policy, research into etiology, and research methods?

Are there exemplary or special studies that indicate how to utilize casualty data for research and policy planning?

Which techniques will determine the presence of alcohol in casualty situations?

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What new research initiatives will best improve the current level of knowledge of alcohol casualties?

The focus of the symposium was on aggregate statistics, although individual, primary data were also presented. Casualties, as an area, were considered to cover accidents, poisonings, and violence and included both mortality and morbidity. Motor vehicle accidents did not form a central consideration, since this area is covered within several other perspectives.

The five-day symposium program involved two main activities: presentation and discussion of papers; and workshops as planned prior to the symposium, as well as working groups that were generated during the meeting.

The detailed program outline along with the names and addresses of participants and authors can be found in Appendices 1 and 2. The body of this book consists of the full text of opening addresses at the symposium, abstracts of the presentations, a paper on plans for future work, and the reports of the workshops and working groups.

The symposium and this report point to the need for better research in the area of alcohol-related casualties. The opening presentations raise key questions: (1) What are the criteria for determining whether alcohol can be considered as a contributory cause? (2) Why should alcohol-related casualties receive more attention now than in the past? (3) Which are the most productive and humane perspectives with regard to alcohol-related casualties?

The abstracts document the themes of the different types of papers and key findings of the meeting. Some papers offered literature reviews from five different regions of the globe by authors with experience in North American, European, African, Latin-American, and Oceanic studies.

Conceptual papers focused on such issues as what researchers and policy-makers are interested in knowing about the role of alcohol in accidents and violence and the relevance of the studies of chronic problems to the investigations of acute complications.

The shortcomings in current methods of assessing alcohol involvement in casualty or trauma cases were documented in several papers. The authors proposed changes in on-site and emergency room techniques and data collection guidelines to allow for more accurate data collection.

The experiences in a number of countries were the foci of overviews of alcohol and casualties. First, considerable variation was noted across countries with regard to the questions posed and type of information available. A second issue was the relationship of casualties to trends in alcohol use and drinking patterns. A

third issue was the relative importance of casualties among the overall mix of alcohol-related problems experienced in the jurisdiction. Finally, some papers alluded to the influence of political climate: for example, even if casualties were considered a major health issue, it is not certain that further research would be feasible or prevention initiatives would receive high priority.

A series of special-interest papers focused on various topics, such as sex differences in self-destructive behavior, the role of alcohol in industrial and recreational accidents, and evidence of drinking among emergency room patients.

Future work in the area of alcohol-related casualties was a key topic of the symposium and was addressed via an overview paper and the workshop and working group sessions reported in this book. The opportunities for discussions about the papers and about future work were utilized extensively in smaller groups. There was enthusiasm for new work and international collaboration in projects.

Following this meeting, there have been developments in several areas. Research proposals and studies based on emergency room clientele are under way in a number of jurisdictions. The World Health Organization has coordinated the development of a proposal for improving the measurement of alcohol and casualties, based on the deliberations of workshops 2 and 3, as outlined in a later section. Several participants are developing plans for a study of major changes in alcohol availability and their impact on casualties and social problems. The National Institute on Alcohol Abuse and Alcoholism, Health and Welfare Canada, and other research organizations are interested in further studies of casualties related to alcohol consumption.

At the time of the symposium in Toronto, several meetings were planned for the next few years. The central themes of the future meetings were not necessarily the same as the ones from this symposium; nevertheless developments at Toronto in August, 1985, contributed to the planning for the future.

Washington. Summer 1986, sponsored by NIAAA. Contact: Leland Towle.

Warsaw. Fall 1986, sponsored by the Psychiatric and Neurological Institute. Contact: Jacek Moskalewicz.

Helsinki. Fall 1987, sponsored by the Finnish Foundation for Alcohol Studies. Contact: Esa Österberg.

Ottawa. 1988, sponsored by Health and Welfare Canada. Contact: Irving Rootman.

Opening Addresses

Towards a Clearer Definition of Alcohol's Role in Casualties

John B. Macdonald

The consumption of alcohol brings pleasure to millions; and to millions it brings misery, illness, or death. Its role in society is perceived by different observers as a blessing or a demon.

An amusing example of the difficulties was offered in an address to the legislature by a Mississippi State Senator in 1985:

"You have asked me how I feel about whisky. All right, here is just how I stand on this question:

"If, when you say whisky, you mean the devil's brew, the poison scourge, the bloody monster that defiles innocence, yea, literally takes the bread from the mouths of little children; if you mean the evil drink that topples the Christian man and woman from the pinnacles of righteous, gracious living into the bottomless pit of degradation and despair, shame and helplessness and hopelessness, then certainly I am against it with all of my power.

"But if when you say whisky, you mean the oil of conversation, the philosophic wine, the stuff that is consumed when good fellows get together, that puts a song in their hearts and laughter on their lips and the warm glow of contentment in their eyes; if you mean Christmas cheer; if you mean the stimulating drink that puts the spring in the old gentleman's step on a frosty morning; if you mean the drink that enables a man to magnify his joy, and his happiness, and to forget, if only for a little while, life's great tragedies and heartbreaks and sorrows, if you mean that drink the sale of which pours into our treasuries untold millions of dollars, which are used to provide tender care for our little crippled children, our blind, our deaf, our dumb, our pitiful aged and infirm, to build highways, hospitals and schools, then certainly I am in favor of it.

"This is my stand. I will not retreat from it; I will not compromise."
(Quoted in Goodwin, 1976, p.4)

One purpose of this conference is to begin a systematic approach to understanding the role that alcohol plays in casualties resulting from accidents, violence, crime, and suicidal behavior. That represents no small task. In spite of the vast literature showing alcohol's "involvement" in countless morbidities, the relationship of alcohol to disease or casualty has been shown to be quantitatively predictable only in the case of cirrhosis, and then only for large populations and based only on per capita consumption. Otherwise, the literature, regardless of whether it deals with disease, automobile accidents, other accidents, or violence, tends to demonstrate only that in a variable proportion of cases is alcohol involved.

The proportion often is high. For example, 32% of suicides, 42% of homicides, and 68% of drownings in New York City had positive blood alcohol levels (Haberman and Baden, 1978). Empirical evidence has been used to support the case that in the United States "half of all traffic fatalities are alcohol-related ... alcohol use is associated with up to 69 percent of drownings ... alcohol has been found to be involved in up to 70 percent of all deaths and 63 percent of all injuries from falls" (U.S. Department of Health, Education and Welfare, 1978, p. 63).

Such figures are startling, and the regularity with which they are reported has had no small influence on the passing of laws, the establishment of policies, and the promulgation of regulations and interventions. Compulsory breath analysis, random roadside checks, harsh drinking-driving penalties, court-ordered treatment of alcoholism or enrolment in alcohol-education programs, and the growth of employee assistance programs in business and industry represent commonplace examples.

All such policies are well intended, and their introduction by legislators and others is understandable, especially given the escalating public anger in many countries at slaughter on the highways by drinking drivers.

Obviously, one very good reason for improving the quality of statistics on alcohol's involvement in casualties is to provide more dependable and more penetrating data for use by legislators and policy-makers. This task is formidable because, as pointed out by a number of critics, there has been in much of the literature a facile leap from the finding of correlations between alcohol consumption and morbid events to conclusions about cause and effect. Judy Roizen put it this way:

"...critics of these estimates have argued that many studies of alcohol involvement in these 'serious events' do not have appropriate control groups, are poorly designed, are atheoretical, assume a causal role for alcohol when it is found to be present, do not use well-defined measures of either the independent or the dependent variables, and do not attend to the context or situation in which the event occurs. The same studies are cited by those who want to 'enhance' alcohol's role in serious events

and by the studies' critics who want to minimize its role. The fact that the same studies can be used either to enhance or to minimize and question alcohol involvement is primarily because most of the research in these areas does not, and in some cases cannot, conform to the standards of epidemiological tradition in which it is rooted."

(Roizen, 1982)

In my judgment, that statement and its implications are at the very heart of the discussions which led to this conference. I reject entirely the notion that we are here to enhance or to discredit the role of alcohol in the causation of serious events. Our intention is to consider how we can deal with statistical and epidemiological problems in such a way as to illuminate our understanding of the nature of the relationship between alcohol and casualties.

Before turning to some brief thoughts on this central issue, I want to digress briefly to recognize another very practical reason it is important to obtain reliable information on a person's alcohol consumption both immediately prior to admission to a casualty unit and historically. That reason relates to the importance of good information for diagnosis and medical management. To make the point, let me simply list a number of circumstances in which knowledge of blood alcohol concentration or the history of drinking is highly relevant or crucial.

1. Subdural hemorrhage can be misdiagnosed as alcohol intoxication with fatal consequences.
2. Alcohol increases the action of anesthetics and its presence increases the risks of anesthesia.
3. The anesthetic effect of high blood alcohol concentration can mask the presence of painful and serious injury.
4. The differential diagnosis of stroke, coronary infarction, and grand mal can be complicated by alcohol intoxication.
5. Liver pathology due to alcohol can create a hazard to the administration of normal doses of acetaminophen.
6. Blood sugar can be depressed when caloric intake has relied on alcohol.
7. Chronic intoxication can result in neuropathy with consequent increased risk of falling.
8. Alcohol dependence may lead to osteoporosis and increased risk of fractures because of malnutrition, liver impairment, and loss of proteins and calcium (Summerhill and Kelly, 1963).

9. Liver pathology may complicate the course of recovery of victims of accidental injury, increasing the risk of death.

These examples point to the importance of obtaining and recording blood alcohol levels in casualty units and also of obtaining and recording good histories of alcohol use and abuse. The point of this digression is to illustrate that beyond questions of the relationship between alcohol and serious injury and the implied legal and policy considerations, there are important medical reasons for routine determinations of blood alcohol levels and recording of alcohol histories.

I return to my interpretation that the central issue of casualty statistics is to understand the nature of the relationships between alcohol consumption and traumatic events. It goes without saying that these relationships are unlikely to be either direct causal relationships or simple relationships applicable to a heterogeneous collection of situations resulting in trauma. It is not easy to imagine a common mechanism for such disparate events as automobile accidents, fires, suicides, falls, and violence. The problem, however, is the unproven assumption that the high proportion of traumatic events in which the victim (in the case of accidents) or the perpetrator (in the case of violence) has been drinking justifies the conclusion that the alcohol (when present) is probably the cause. The attribution of cause requires much more than mere evidence of juxtaposition.

Drawing from one category of traumatic events, namely violence, PERNANEN (1980) has pointed out some of the problems of interpretation. While it is clearly the case that alcohol is present in a high proportion of violent crime, other evidence is difficult to reconcile with the notion that alcohol is a cause or even necessarily a contributor to such phenomena. First, there is great variation in behavior exhibited after alcohol consumption by different cultures. The Camba people of eastern Bolivia drink at festive occasions for days on end. Stupor or coma is common, yet there is no increase in aggressive behavior or violence. Second, a very low proportion of all drinking is accompanied by physical aggression. Third, experimental studies of the effect of alcohol on aggressive behavior suggest that factors other than alcohol consumption are implicated in the alcohol-aggression relationship (Graham, 1980). Indeed, overwhelming evidence from many fields has demonstrated that causation is rarely if ever simple. The agent of a particular infectious disease represents only one element in a complex chain in which other links such as sanitation, crowding, poverty, nutrition, immunologic status, and even the weather may play crucial roles. Similarly, the role of alcohol in road accidents may be modified by road conditions, lighting, the use of seat belts, speed limits, policing, cultural norms, and other factors.

Biological scientists will recall the recorded debates over bacterial causation of disease from the nineteenth century. The debates culminated in a set of postulates by Robert Koch (1891) defining the conditions that must be met to justify the

conclusion that a particular organism was the cause of a particular disease. The postulates stated were the following:

1. It must be possible to isolate the organism from all victims of the disease.
2. The organism must be grown in pure culture.
3. The pure culture, when injected into a suitable experimental animal, must produce comparable disease in the animal.
4. It must be possible to isolate the organism in pure culture from the infected animal.

Koch's postulates contributed scientific rigor to claims that the cause of various diseases had been identified. It must be noted, however, that it has not always been possible to fulfil the postulates, and other means including immunological data and epidemiological studies have had to substitute for one or another step. *Treponema pallidum* is known to be the cause of syphilis, though it has never been grown in the laboratory. The acid-fast bacillus found in leprosy tissues has not reproduced disease in any experimental animal. Finding the cause of Legionnaire's Disease was heavily dependent on sophisticated epidemiology. In short, Koch's postulates, though highly important, are not a perfect answer.

I draw this item of microbiological history to your attention because I want to suggest that an analogue of Koch's postulates is needed in looking at the role of alcohol in casualties. Obviously, Koch's notions are not directly transferable, but the idea of defining the conditions which must be met to justify claims of an etiological role for alcohol may have merit.

As a first step in moving in this direction, I suggest the following:

1. The incidence of the event should be higher among drinkers than non-drinkers in otherwise matched samples.
2. The incidence of the event should correlate positively with the blood alcohol level.
3. The incidence of the event over time should correlate with the availability of alcohol.
4. In populations or situations where the availability of alcohol is temporarily restricted (e.g., strikes, police action), the event should be concurrently reduced in frequency.
5. The behavior responsible for the event should be consistent with the known pharmacological effects of alcohol.

I make no claim for these proposals except to say that the larger the number of these conditions that can be met, the more justifiable would be the claim that alcohol played an etiological role. Perhaps you will disagree with my suggestions; perhaps you can define better postulates. I look forward to the debate and the prospect of consensus on this important topic.

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Alcohol-Related Casualties: A Problem That Needs To Be Addressed

Robert Niven

The leading cause of death in the United States among people under 44 years of age is unintentional injury. More than 100,000 Americans die annually as a result of accidental injuries--nearly half involving motor vehicles and the rest from falls, burns, poisonings, drownings, occupational injuries, and other causes. In addition, more than 70 million Americans are estimated to require medical treatment annually as a result of non-fatal unintentional injuries. Despite the wide variety of circumstances in which these deaths and injuries occur, a common element in many of them seems to be the involvement of alcohol and other drugs (U.S. Department of Health and Human Services, 1983). In fact, the potential for some of these problems to occur may even be heightened by moderate consumption (Moore and Gerstein, 1981). Unfortunately, the frequency and the extent of such substance involvement are not sufficiently known or understood. We do know, however, that injuries resulting from alcohol misuse cost society, in terms of increased medical care, lost production in the work-force, disruption of families, and premature death.

Some research has addressed the physiological effects of alcohol on human performance, but very little research has focused on the actual impact of alcohol on particular tasks such as driving a car, operating household equipment, or operating industrial machinery. Epidemiological studies of these events are critical if we are to identify high-risk groups and ecological variables associated with fatal accidents.

The role of alcohol should be a major focus in the epidemiological study of accidents and injuries. In the past, the role of alcohol typically has been investigated in terms of the presence of alcohol shortly before or at the time of the event. Epidemiological studies of traffic accidents have demonstrated that between 30% and 60% of all fatalities are alcohol related. Epidemiological studies also suggest that alcohol is a large contributing factor in violent criminal assaults.

The physiological effects of alcohol are well known to the medical community. Body functions are depressed so that judgment, balance, vision, and reaction time are considerably affected. These effects in combination with potentially haz-

ardous environments, such as driving a car, operating industrial machinery, swimming, or smoking at home, place people in at high risk of becoming involved in a serious accident in which a life may be lost.

The role of alcohol in casualties should be of concern to those in the medical and legal fields. Doctors on duty in emergency rooms and clinics where the injured are transported should be especially alert to the presence of alcohol in victims of accidents or violent crime. We know, for example, that patients with head injuries (a very common form of injury in traffic accidents) who have also been drinking are sometimes misdiagnosed because of the alcoholic suppression of the brain's function. The misdiagnosis can lead to inappropriate treatment. As early as 1915 one physician commented that:

"Alcohol obscures the diagnosis; alcohol increases the danger of infection at the time of the accident; alcohol prevents adequate treatment; alcohol increases the danger of inter-current complications; alcohol retards the process of repair; alcohol gives a poorer end result; alcohol increases the mortality in accidents." (Brickley, 1915)

The role of alcohol in deaths and injuries is also significant to the judicial system. In many instances, particularly traffic accidents, the presence of alcohol may affect the outcome of the court's decision and sentencing. At the present time, even in fatal accidents involving alcohol, a conviction for driving while impaired (DWI) is not automatic. In some instances, the presence of alcohol during the commission of a crime by a chronic drinker may be considered mitigating circumstances. The reasoning is that the alcohol affected the offender's judgment and therefore he or she was not responsible for the actions. At the least, it should be possible to assess the need for alcohol treatment for the person convicted of an offence involving alcohol. With the increased pressure for a minimum drinking age of 21 and the current state of "dram shop" laws, the legislative community is in urgent need of epidemiological data that can be brought to bear on these issues.

Despite the large number of people injured or killed each year in accidents and crime, and the apparent professional interests of the medical and legal community, not enough research has been done examining alcohol involvement in such events.

Several barriers have inhibited progress in undertaking epidemiological research of alcohol-related casualties. First, we have not adequately supported the development and maintenance of comprehensive, fully automated data collection systems capable of compiling information on fatal and non-fatal serious events. This problem is particularly exacerbated in the case of non-fatal accidents where many of the injured do not reach the hospital or clinic and, therefore, the injuries remain undocumented.

A second barrier results from the personal biases of researchers in the alcohol field. Historically, many researchers presumed that alcohol's involvement in some types of accidents, particularly those occurring in the workplace, was too minimal to warrant investigation. Some studies of the role of alcohol in the workplace have emphasized the loss of production. These studies reason that most work environments are not hazardous to the employee if he or she is intoxicated, since the drunk employee typically does not show up for work, and thus avoids the risk of involvement in an accident.

Other barriers to epidemiological studies of casualties are unintentionally erected by the very professionals with the most to gain from such research. Even in the case of traffic accidents, where we have a relatively comprehensive data set available for analysis, it is possible to illustrate these barriers.

The effort against drunk driving was aided in 1975 by the implementation of the Fatal Accident Reporting System (FARS), a reliable, systematic, and nationwide data collection program. FARS collects data on all traffic accidents occurring in the United States that result in the death of at least one person within 30 days of the accident. Two of the variables collected by FARS are measures of alcohol involvement. These are the blood alcohol concentration (BAC) test, a chemical analysis of alcohol levels in blood, and the judgment of the investigating officer as to whether or not alcohol was present. Estimates of alcohol involvement from FARS data are usually thought to be conservative, since BAC tests are not routinely administered across state and local jurisdictions, and police tend to be cautious in judging the presence of alcohol.

Most experts agree that routine and consistent BAC testing is the best available method for accurately measuring the presence of alcohol in fatal traffic accidents. However, for a variety of reasons this is not the practice. Part of the explanation for this situation lies with the method by which the data are collected.

Mortality data are compiled from death certificates completed by medical examiners and coroners. Usually, the direct cause of death and any underlying causes are reported in some detail. When mentioned at all, alcohol is usually noted as an underlying cause of death. However, it is not uncommon for death certificates to omit mention of alcohol, either because no determination was made or because the coroner did not wish to cause any further discomfort to the victim's family.

In the case of drivers who survive the accident and are taken to emergency rooms, the administration of a BAC test has often been considered a low priority in the context of life-threatening situations. The timing of a BAC test is critical. To be accurate, a test of blood alcohol concentration should be done as soon as possible, and preferably before any therapeutic intervention is made.

Despite these limitations, FARS data do provide a useful estimate of the degree of alcohol involvement in fatal traffic accidents. FARS data indicate that, in 1983, approximately 40% of the more than 45,000 fatalities were alcohol-related. Several coroners across the country who conducted their own independent studies put this rate at closer to 90% (Chapman, 1985). The fact that these coroners insisted on BAC tests for all drivers involved in fatal accidents explains the discrepancy between their data and the FARS data.

Determination of alcohol involvement in non-fatal traffic accidents is even more problematic than it is in fatal accidents. Certainly, reporting bias and inconsistency in administering BAC tests contribute to the problem. In addition, there are other barriers to estimating risk that are unique to non-fatal accidents.

One overwhelming problem is the sheer number of traffic accidents that occur each year. The National Accident Sampling System (NASS)--a system complementary to FARS that focuses primarily on non-fatal traffic accidents--estimates that in 1983 there were 5.8 million traffic accidents. The NASS is physically unable to collect data on every one of these accidents, and therefore, national totals are projected from a statistically selected sample.

A second barrier to estimating the risk of alcohol involvement in non-fatal accidents is the tendency of police to not request a BAC test or to make a judgment on alcohol involvement.

We know even less about casualties that do not occur on roads than we do about traffic accidents. The vital statistics branch of the National Center for Health Statistics publishes detailed mortality figures for several classes of accidents and criminal events including falls, fires, drownings, homicides, and suicides. However, very little detail is reported for these injuries, and the extent to which alcohol is involved in these events is never recorded.

In the absence of systematic, nationwide data collection programs for fatal and non-fatal non-traffic accidents, the best that we can do is estimate the rate of alcohol involvement in different classes of serious events. Roizen (1982) summarizes the results of several recent studies on alcohol involvement in serious events. She presents ranges for the percentage of alcohol involvement in a particular event based upon two or more specific studies (see Table 1). The wide ranges shown in the table demonstrate the need for more accurate measures. They may also imply definitional differences, or they may be true estimates of differential incidence and prevalence.

Public awareness and concern over the consequences of alcohol use and abuse have grown in recent years. It is time for the alcohol research community to address the problems I have outlined. The medical community and the criminal justice system have a strong interest and concomitant obligation to support the

development and implementation of comprehensive, systematic reporting systems. Automatic reporting of alcohol involvement in the medical diagnosis of all fatal and non-fatal accidents will enable doctors to more accurately diagnose and treat their patients. Recently, the American Medical Association (AMA) expressed its

TABLE 1
Estimated Proportion of Alcohol's Involvement
In Accidents, Violence, and Suicide

Type of Serious Event	Rate of Alcohol Involvement Range %
Non-traffic fatal accidents	
Industry	9-40
Drowning	4-83
Fire	12-83
Falls	10-50
Non-traffic non-fatal accidents	
Industry	7-47
Fire	17-61
Falls	13-63
Crime	
Homicide offenders	28-86
Homicide victims	14-87
Assault offenders*	24-72
Assault victims	4-79
Sex offenders	13-63
Sex victims	12-69
Suicide	
Attempted	15-64
Completed	0-80

* From Roizen (1982).

continuing concern over the incidence of injury and death resulting from drunk driving. At the AMA 1983 meeting, this serious public health problem was the subject of a resolution establishing the goal of reducing deaths and injuries due to drunk driving by 50% during the next five years and by an additional 25% during

the following five years (Chapman, 1985). Reaching this goal will require the strong leadership of the medical community to introduce consistent diagnostic practice in emergency rooms, clinics, and coroners' offices.

In July 1985, the American Bar Association endorsed a 20-point program outlining a comprehensive effort to combat alcohol and drug problems among youth, including raising the legal purchasing and possession age to 21, making health insurance mandatory, enforcing dram shop liability laws, removing barriers to treatment of youth, and increasing awareness among judges and lawyers. Hopefully, this initiative will lead to some concrete actions.

The criminal justice system should begin to implement mandatory and consistent BAC testing in all traffic accidents. The courts should begin to assess the myriad laws defining exactly who may sell alcoholic beverages, when, where, and to whom. With the exception of drinking-driving and dram shop laws, there is little legislation that imposes stiffer penalties if alcohol is involved. We cannot afford to overlook the presence of alcohol in traffic accidents.

In 1985 the National Institute on Alcohol Abuse and Alcoholism undertook an initiative to focus some of its research grants on the effect of alcohol on human performance and its role in traumatic injury. The research activities in this problem area will require specialized contributions primarily from neurological and behavioral sciences, but also from biomedical, clinical, and epidemiological studies. We are encouraging the systematic investigation of the extent, cause, and results of alcohol-involved unintentional injury and death as they are related to transportation, occupational, home, and recreational activities. Investigators should begin to study the effects of alcohol on selected simple and complex behaviors, ranging from basic neuromuscular and cognitive functioning to the performance of highly skilled tasks, such as driving a car, flying an airplane, or operating sophisticated machinery and equipment.

This basic research will enable us to better understand the extent of the problem. But we cannot stop there. As epidemiologists, we can all agree on the importance of being able to document and project the level of alcohol involvement in casualties. The development and implementation of comprehensive, systematic reporting systems will enable us to estimate the portion of the population who are at risk in various settings. Having done that we can begin to effectively treat the victims of alcohol-related casualties and concentrate on prevention.

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Developing a Comprehensive Response to Alcohol-Related Casualties

Marcus Grant

Alcohol-related casualties are serious and widespread and show no signs of diminishing. Just how serious and widespread they are was acknowledged in resolution WHA36.12 of the Thirty-Sixth World Health Assembly in 1983, which unequivocally ranked alcohol-related problems (including casualties) among the world's major public health concerns. What is most alarming of all is that, as the worldwide trend in alcohol consumption continues to rise, there follows in its wake increases in a multitude of different alcohol-related problems that take their toll, not only in countries that have traditionally experienced such problems, but also, more and more often, in countries and population groups that have until recently seemed relatively immune. This is particularly true of casualties--not just on the roads, but also in the home and at work. When the victims of domestic and criminal assaults are added, the list of problems can be quite extensive.

The need to tackle these problems is an urgent one. The World Health Assembly emphasized in that same resolution the necessity for countries to develop comprehensive national alcohol policies. In doing so, it followed the conclusions reached during the technical discussions the previous year, when it recognized that such a flood of problems of so many different kinds is unlikely to be stemmed by any single strategy of intervention, no matter how effective.

It is possible to see the world of alcohol casualties as a battlefield. As far as one can see, there are casualties. Some are already dead, some are dying, and others are still making desperate and pitiful efforts to save themselves. They are the casualties of the damage caused or exacerbated by excessive drinking. They are the victims of domestic violence, including child abuse. They are the suicides. They are also the sufferers from a whole range of physical and mental health problems. Despite the severity of the condition of these casualties, despite the apparent ubiquity of the battlefield, there seems little sign of any abatement in the hostilities. The great heaps of dead and dying mount daily higher.

There is, of course, concern. Faced with such carnage, it would be difficult to maintain indifference, either at a national or international level. But concern does not in itself presume effective action. It seems, indeed, that there has been some

disagreement about how best to proceed in dealing with the costly and distressing problem of this global battlefield.

Various strategies have been suggested. There are, first, the laissez-faire, free market economists whose view is that man is by nature a warlike animal; that the carnage is indeed distressing, but that, given the right approach, it need not necessarily be quite so costly as seems inevitable at first sight. They point to the long history of the hostilities and to the indications that they are, if anything, increasing. In such circumstances, the elasticities of demand being favorable, they see worthwhile opportunities for the state to maximize revenue. If the battle is a fact of life, then it can be taxed to the hilt. A proportion of the revenue thus generated may have to go to financing services to alleviate the suffering of the casualties, but the world population problem being what it is, it is probably not a bad idea to allow the scale of the battle to continue to escalate.

Such a view, of course, is incompatible with the public health perspective, incompatible with a sense of common humanity, and incompatible, certainly, with the global mission of the World Health Organization. What, then, are the health options that are proposed as alternative strategic approaches?

There are, first, those who see the most urgent need as the improvement of the efficiency of the treatment systems. Confronted by the horrifying spectacle of all those casualties, they argue that the first priority must be the welfare of those already damaged. They plead for better hospitals, better accident and emergency units, better psychiatric care, more staff, and new technology. Then there are those who, without wishing to ignore the plight of the present sufferers, believe that the priority must be the prevention of future suffering. There are two separate camps within this group. Supporters of one of these, arguing for health promotion, seek to persuade the combatants to lay down their arms or, at the very least, to use them for sporting purposes only. They are also anxious to counsel those who, though wounded, may yet recover if only they see the error of their ways and crawl away from the battlefield. The other camp, still in sympathy with the broad aim of prevention, has little faith in the likely effectiveness of these persuasive efforts, however eloquent or rational they may be. This camp holds the view that the only way to reduce the battle is to reduce the means with which to fight it. They argue for control policies that would restrict the number of official munitions stores or, like the economists but with a different aim in mind, charge such a high fee for the privilege of fighting that few would be prepared to pay it.

None of these strategies is ridiculous. All have their advantages and would, in one way or another, lead to improvements in the present intolerable state of affairs represented by the alcohol problems battlefield. What is, however, immediately apparent is that while *any* strategy might have *some* effect, all are partial. If, indeed, the level of casualties is to be reduced, then the economists, the treatment

agencies, the health promoters, and the control policy advocates all need to be brought together. Researchers also need to be persuaded to come out of their bullet-proof hides to help in forming a concerted and integrated approach to the development of a range of linked strategies that can be continuously evaluated. That, in essence, is what a national alcohol policy is all about.

Resolution WHA36.12, which was referred to above, is emphatic about the importance of countries developing comprehensive national alcohol policies within the context of their national health development and planning. In support of this process, and in order to be able to come to more definite conclusions about the various trends in alcohol consumption and alcohol-related problems that are central to the development of national policies, real improvements in the collection of data are required. This is the final field where national and international efforts need to be closely linked. Countries that are not accustomed to gathering data on alcohol consumption and alcohol-related problems may need special help from the relevant international organizations. This could lead to an extension of valuable cross-national research initiatives to include countries previously under-represented in such studies.

Even among those countries that already gather data on alcohol production and consumption and on alcohol-related mortality and morbidity, greater comparability remains an urgent requirement despite repeated resolutions of the World Health Assembly. So, too, does the encouragement of better time-series analyses of trends in alcohol-related problems. Developing countries, with scarce resources to devote to the compilation of data, may need guidance on which key indicators provide the most effective way of monitoring the impact of alcohol policy initiatives.

In view of the increasing importance of an economic perspective, quantification of the health and social costs of alcohol consumption may require special attention. Although alcohol-related casualty statistics are by no means the only data where better collection could be beneficial, they are especially important for at least two reasons. First, for many countries, health and social costs may represent one of the most rapidly growing of the problems related to alcohol; and second, because they are more visible, they may be more politically persuasive. Better alcohol casualty statistics can therefore contribute positively to national policy development and monitoring.

Of course, scientists as well as politicians need to recognize that alcohol policies do not drop ready-made out of the sky. They have to be stimulated, developed, and negotiated afresh for each country. They have to be sensitive to the history of the country, its culture, and its drinking practices. They require imagination, tolerance, hard work, and a sense of vision. They need to be prepared, formulated, and promoted, taking into account a wide variety of legitimate but

sometimes competing interests. All this is a formidable task, but a necessary one, if alcohol-related problems are really to be reduced in any worthwhile way.

In this formidable task, WHO can and must provide a lead, both globally and regionally. It can provide a lead through the coordination of international effort. It can offer a lead through the active promotion of relevant concerns, both in its own programs and in its relationship with Member States. Such a lead has been called for in the resolution of the World Health Assembly (WHA36.12) referred to above. There is, in a real sense, no alternative. If WHO does not take this lead, then the world can look forward to further increases in alcohol consumption and to ever-mounting casualty rates from the awful battlefield of alcohol-related problems, until health for all by the year 2000 becomes a very hollow toast indeed.

Note: This brief paper is adapted from material by the author in chapters 1 and 9 of M. Grant (Ed.) *Alcohol Policies*, WHO Regional Publications, European Series No. 18, 1985.

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Alcohol-Related Casualty Statistics in Ontario and in Canada Today and in the Realizable Future

Manuella Adrian

There is no regular comprehensive reporting system for all direct alcohol-related casualty statistics in Canada. Partial information is available from a variety of existing federal and provincial administrative reporting systems and from special surveys.

Official statistics provide the following information:

In 1982 in Ontario, there were 491 fatal and 12,384 injury traffic accidents involving drivers of motor vehicles or snowmobiles (9 fatal accidents, 86 injuries), and impaired pedestrians (56 fatal accidents, 554 injuries). In Canada, 59.7% of tested driver fatalities had positive blood alcohol concentrations (BAC).

In 1982 in Canada, there were 36 fire injuries and 23 fire deaths due to impairment by alcohol, drugs, and/or medicaments.

In Canada from 1961 to 1974, alcohol had been ingested prior to the murder in 41.4% of solved murders. This includes murders where there was a known relationship between victim and suspect. Over one-quarter (29.7%) of murders between business relations involved alcohol, and 62.4% of murders in common-law families involved alcohol. For bar brawl murders, 29.3% of murders involved alcohol in brawls instigated by the victim and 7.8% in brawls not instigated by the victim. In sexual assault murders involving children, 15.6% involved a drunk suspect. In adult sexual assault murders, 23.7% involved a drunk victim and 40.7% a drunk suspect. Finally, with regard to robbery and murders, 11.1% involved a drunk victim and 17.9% a drunk suspect.

In 1980-81 in Canada, there were 44,021 cases treated for alcohol diagnoses on an inpatient basis in general hospitals and 4,172 in psychiatric hospitals.

In 1981 in Canada, there were 3,477 deaths directly due to an alcohol diagnosis.

A special study of the Ontario-wide Hospital Medical Records Institution (HMRI) data base revealed more detailed information on alcohol and its role in casualties. There were 13,139 cases with primary alcohol diagnoses and another 20,445 with secondary alcohol diagnoses in 1983-84. Between 60% and 70% of all the inpatient cases were admitted through the emergency departments at almost twice the rate for cases with all other diagnoses. About 20% of all emergency alcohol cases had injury diagnoses, consisting mostly of poisonings (37%-54%), fractures (16%-25%), intracranial injuries (10%-16%), and head wounds (5%-10%). External causes leading to injuries were almost equally divided between suicide (29%), falls (24%), and injury (24%).

It is estimated that there are approximately two million visits annually to emergency departments in Canada due to alcohol-related injuries. These consist of 300,000 with alcohol injury diagnoses, one million with injury diagnoses and a hidden alcohol component to their injury, and 750,000 whose injuries resulted from the action of another person under the influence of alcohol.

A Proposed Model Establishing an Alcohol-Related Casualty Surveillance System

Sherrie S. Aitken and Terry Zobeck

This paper presents a model for a U.S. national reporting system for documenting alcohol-related casualties. The rationale for undertaking a national-level epidemiological survey of casualty events that includes an investigation of alcohol involvement is discussed. The kinds of information that would be required and the manner in which it could be acquired are elaborated upon.

Data adequate for estimating the incidence and prevalence of alcohol-associated casualties would minimally contain information on the time of day, day of the week, location of the casualty event, type of casualty event, and whether alcohol use at the time of the incident was suspected or confirmed. Relatively rare casualty events could be oversampled to increase the validity of the estimates.

The identification of particular populations at risk for alcohol-associated casualties of various types would require a sophisticated data collection effort. In addition to the information required for simple estimates of incidence and prevalence, socio-demographic information would have to be collected. The sampling scheme would also have to allow for description of risk by geographic unit. Another level of inquiry would analyse the association of casualty events with other variables thought to be within the complex causal nexus surrounding casualty events. Ideally, the data collection process would provide for the data to be matched for casualty and non-casualty events by person factors, casualty factors, environmental factors, alcohol involvement, situational context, and the time of day and day of the week referenced.

A model injury surveillance system would have the following features: (1) centralization of notification, command, and control; (2) centralization of integration of information and reporting; (3) immediacy of information; (4) simplicity of key surveillance information; (5) true surveillance by generation of continuous statistics and reports; and (6) online report generation with data input to a central unit.

The kinds of information that ought minimally to be collected on publicly known casualty events would include an event I.D. number, event type, location, time, the number injured, and the number dead. For each injured or dead casualty victim the event I.D. would link information coming from various sources, such as information on the nature and severity of injury, the BAC level, apparent (tested) or reported alcohol involvement, blood pressure, and/or their disposition or destination. All this would be collected as well as some demographic information. Linkages would be made between the data derived from several reports, including: (1) the original event report to which an event number would be assigned; (2) a supplemental initial diagnostic report assigned a victim number; (3) a supplemental diagnostic, evaluative, or treatment report; and (4) other agency reports. Report sources would include fire, police, emergency, trauma units, Federal Aviation Administration, Coast Guard, and others responsible for identification, diagnosis, and disposition.

The development of a centralized injury notification system integrating key sources of information and generating continual statistics would be facilitated by the testing of a pilot injury surveillance system. Operating a pilot injury surveillance system on a country-wide basis would require the following:

1. agency protocols for cooperative system maintenance;
2. on-site keying-in of data in emergency vehicles;
3. a centralized mini-mainframe computer for report collation and data aggregation;
4. 24-hour monitoring of the system operation;
5. assignment of an event I.D. by a centralized unit; and
6. central dispatch of the data collection vehicles.

In many U.S. states the agency protocols for cooperative system maintenance and 24-hour monitoring of the system operation could be created easily by modifying the system currently in place to respond to casualty events.

Alcohol-Related Casualties in Oceania

Sally Casswell

Oceania includes a large number of small island states. Almost all are less developed countries, and some, without mineral resources, a tourist industry, or strategic importance, are very poor. New Zealand is the one industrialized country and now has a majority of non-Polynesian inhabitants.

Although alcohol was introduced to the region during the seventeenth and eighteenth centuries, commercially produced beverages have only been legally available to the indigenous people of many of the islands during the past 20 to 30 years. In many, per capita consumption levels remain at 2 litres or less of absolute alcohol, in contrast to the levels (7-8 litres) typical of industrialized countries such as New Zealand.

The few survey and ethnographic data available suggest that some drinkers are consuming amounts comparable with regular drinkers in industrialized countries. Furthermore, the typical drunken comportment observed in many countries of the region, particularly in Melanesia and Micronesia, in which aggression appears a significant component, suggests that alcohol-related casualties are likely.

The limited amount of quantitative data on alcohol involvement in casualties in the less developed countries in the region come from post mortem blood analyses of trauma deaths in one Melanesian country; they suggest a level of alcohol involvement in traffic casualties comparable to that of industrialized countries. Alcohol involvement was also present in about half of non-traffic trauma deaths. Ethnographic data also indicate alcohol involvement in a variety of casualties. Violence, for example, was observed to be more likely during disputes if drinking had taken place, and the indigenous people ascribe a causal role to alcohol. Such a perception of a causal role for alcohol is also indicated by the monitoring systems set up by small countries in the region to assess alcohol involvement in crime and violence.

Despite a lack of detailed data to describe alcohol involvement in casualties, a variety of evidence from ethnographic studies, surveys, blood alcohol measurements, self-report, and police estimates suggests that alcohol-related casualties are present in the region. As morbidity and mortality from infectious diseases are

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reduced by socio-economic development, the role of casualties assumes greater importance, and so, it is likely, will the role of alcohol in these casualties.

Data on Alcohol-Related Casualties: Public Policy Information Needs

Ron Draper

Existing data on alcohol-related casualties have several shortcomings from a policy-maker's perspective. The major ones stem from the narrow focus of research on alcohol-related casualties, its preoccupation with enumeration of events, and the tendency to equate number of alcohol-related events with adequate description of the problem. Alcohol-related casualties are a manifestation of social, institutional, political, and economic relationships in society. They are an out-growth of societal, cultural, and group norms, public knowledge, beliefs, values, and perceptions relating to the phenomena, their "acceptability" or moral repugnancy, and a great many other factors. Little of this information is available to the policy-maker or likely to be available unless the present scope of research is expanded considerably.

This requires a reconceptualization of the problem from the point of view of policy-makers. In particular, it means understanding that policy-making involves politics, values, issues, people and their perceptions, and costs. Researchers must therefore do the following: clearly delineate the role of research in the political process; articulate the values implied in their work; define the underlying issues explicitly; identify the perceptions and characteristics of groups who have a vested interest in alcohol-related casualties and their eradication; and consider the costs of public policy initiatives within a political context. Researchers should begin by identifying the target policy group, defining their specific needs, and use this as a basis for defining research questions and related data requirements.

It is only when the study of alcohol-related casualties is expanded to include consideration of the entire phenomena that it will fulfil the needs of the policy-maker and contribute to societal consensus regarding acceptable means for its control. In addition, a redefinition of research and the roles and responsibilities of researchers within a sociopolitical context is required. Unless the research community is willing to adopt a greater share of responsibility for problem resolution in relation to alcohol-related casualties, it is unlikely that the information required for policy formulation will ever exist.

Blood Alcohol Levels Found in a Forensic Laboratory: Possible Relation to Casualties

**Juan Carlos García Fernández
Heraldo Donnewald
Manuel Guatelli**

This paper is based on the view that alcohol in a corpse's blood, obtained in autopsies at a judicial morgue, may be a good indicator of a possible relationship between alcohol and casualties in persons who have consumed alcoholic beverages some time before their death.

Between 1981 and 1984, blood alcohol analyses were carried out at the laboratory of the Forensic Medical Body, National Judicial Power (Buenos Aires, Argentina). Of these analyses of 1,405 males and 576 females, 179 showed positive indications of alcohol (11% of the males and 4% of the females). Also, 86.6% showed a level higher than 0.49 g/L.

The results of quantitative determinations of blood alcohol samples conducted in 1984 have been included in Form No. 2 of the series used for a complete study carried on at the judicial morgue. This form includes the cases according to their etiology and judicial name of the cause.

When the total number of positive blood alcohol determinations were distributed according to their etiology, the following results were obtained: accidents 19.6%, suicides 14.1%, total homicides 31.9%, and doubtful deaths 34.4%. When the deaths that are the consequence of traffic accidents are subtracted from the total homicides category, the number of homicides decreases and the number of accidents increases (accidents 42.9%, suicides 14.1%, homicides 8.6%, doubtful deaths 34.4%).

The origin of death in cases of positive cadaveric blood alcohol determination can also be examined by cause of death. When expressed in relative percentages, the results were: natural deaths 25.4%, traffic accidents 22.5%, firearms 11%, railway accidents 6.9%, intoxications 6.9%, jumping falls 6.4%, work-related acci-

dents 4.6%, submersion 4.0%, home accidents 3.5%, cutting weapons 2.9%, simple falls 2.3%, asphyxia 1.2%, burns 0.6%, and electrocution 0.6%.

In conclusion, the presence of ethyl alcohol has been shown in corpses' blood in many cases of casualties by the analytical methodology described in the paper. Blood alcohol levels are also considered by sex and age. The relative importance according to the type of casualty is a special consideration in this paper.

Sex Differences in Alcohol-Related Casualties: The Case of Self-Destructive Behavior

Roberta Ferrence

The purpose of this paper is to address the following questions relating to sex differences in the prevalence and reporting of alcohol-related self-destructive behavior: How does alcohol involvement in self-destructive behavior vary by sex? What gaps are there in these data? Does the reporting of alcohol involvement vary by sex? Does the etiology of alcohol-related suicide and self-injury vary by sex? Can the findings be generalized to other alcohol-related casualties? Sources of data used to answer these questions include Canadian mortality and morbidity statistics, studies of alcoholics, studies of suicides, and surveys of attempted suicides. Findings from a large set of original Canadian data on self-injury are also included.

On the basis of the analyses performed and evidence from other studies, the following conclusions can be drawn:

1. Alcohol involvement in self-destructive behavior does vary by sex, but in most cases these differences reflect sex differences in drinking habits in the general population. However, female alcoholics appear to be at greater risk of suicide, compared to other women, than male alcoholics are, compared to other men.
2. There are insufficient data to conclusively test our hypotheses. Those data sets that are sufficiently large, comprehensive, and lengthy to carry out appropriate tests do not provide systematic reporting of alcohol involvement. Official statistics on mortality and morbidity are of this type. Studies that provide good information on prior drinking and usual pattern of drinking are usually single cross-sectional studies limited to one community or hospital. Only coroners' reports appear to offer relatively consistent data on prior drinking among suicides that could be analysed over time, but even here some under-reporting occurs due to low rates of testing in some communities.
3. There is no evidence to support the notion that alcohol involvement in self-destructive behavior is underreported for women.

4. The question of sex differences in the etiology of alcohol-related self-injury and suicide cannot be answered on the basis of the data. Because sex differences in drinking behaviors associated with self-destructive acts reflect those of the general population, there may be nothing special about this particular form of deviant behavior. Sex differences in the general etiology of drinking behavior, such as drinking contexts, social expectations about drinking, and physiological factors, probably also apply to the specific case of self-destructive behavior.

5. Findings from this research can be generalized to other alcohol-related casualties in two ways. First, the lack of evidence for sex differences in the under-reporting of alcohol involvement can probably be generalized to other casualties. Second, the suggestion that drinking by self-injury and suicide cases is heavier, but still reflective of patterns in the general population, may also be generalizable to other alcohol-related casualties.

The Alcohol Dimension in Casualty Reporting Systems

Honey Fisher

The "Casualty Reporting Systems Questionnaire" was developed with the intention of examining the state of casualty reporting systems especially as they relate to alcohol within different countries around the world. This paper presents a brief overview of the reporting systems of 10 jurisdictions in North and South America, the Caribbean, Africa, Europe, Australia, and New Zealand. Tables indicate what casualty reporting systems exist, jurisdictions in which it is mandatory to report alcohol involvement, and methods of alcohol detection used.

Although in theory it is mandatory to include any alcohol dimension within a reported casualty, what generally happens is that the reporting of any alcohol involvement is discretionary, with the result that alcohol involvement in health and social problems is systematically underreported in the statistics. The paper takes an in-depth look at one reporting system--hospital morbidity statistics--and uses this to exemplify the problems inherent in reporting systems. It explores several intervening aspects that confound the simple relationship between an alcohol-related event resulting in a hospital admission and the record that appears in official hospital statistics. These sources of complications are: (1) the medical practitioner's training, orientation, and workload; (2) diagnostic bias arising from cultural mores and social pressures; (3) classification policies and instruments; and (4) information transfer and conversion. These intervening aspects do not render these statistics worthless; however, they should be kept in mind when assessing the utility and meaning of these data.

The suggestion is made that other data bases, such as alcohol sales figures, self-reported consumption from surveys, or police data on alcohol-related incidents, can be corroborating sources of evidence for estimating the scope of alcohol-related problems. It would seem beneficial to go through other reporting systems, tracing the steps involved in the process of collecting and reporting the data. Discovering where the potential complications lie would be a first step in attempting to minimize inaccuracies in the data and produce a more representative picture of alcohol-related problems.

Prevalence of Alcohol Use, Alcohol-Related Diagnoses, and Casualties in Santiago de Chile Emergency Services

**Ramón Florenzano, Alfredo Pemjean,
Pamela Orpinas, and Jorge Manzi**

This study evaluates the extent of use and abuse of alcohol, as well as its health-related consequences, in four busy emergency wards in Metropolitan Santiago. One hundred and ninety-eight males 15 years and older, seeking medical attention, were randomly selected and studied via the following instruments: breath analyser, alcohol-tape, clinical appraisal of alcohol intake performed by a member of the research team, Test de Selección de Bebedores-Problemas (T.S.B.P.)--a Chilean version of the MAST, and the medical diagnosis registered in the Emergency Service clinical chart.

The subjects' average age was 35.4 years (range 15 to 77). Evidence of alcohol consumption was found in 10.8% to 16.5% of the sample, and heavy use was detected in 7.2% to 8.3%. Measurements of alcohol consumption by the various instruments were highly correlated with each other: alcohol-tape/breath analyser, 0.86; alcohol-tape/clinical appraisal, 0.80; breath analyser/clinical appraisal, 0.89.

According to the clinical chart diagnosis, a medical emergency directly related to alcohol use was recorded in 4.5% of the cases.

The medical diagnoses were classified according to ICD-9 groups. The most frequent group was accidents (37.4%) and gastrointestinal pathologies (17.4%). The correlation of accidents with alcohol consumption is clear: of the 16 cases that had high alcohol intake, 10 belonged to the accidents category.

Through screening questionnaires (T.S.B.P.) on the same population, the 65.2% of the subjects were classified as problem drinkers. They were evenly distributed among the different diagnostic categories.

This paper emphasizes the importance of emergency services for the early detection of alcohol-related problems. The use of alcohol-tape has some advantage over the direct measurement of blood alcohol level (BAL) and the breath analyser in terms of its cleanliness and expediency, and could thus be used as a routine measurement. An adequate utilization of short screening questionnaires also could be a relevant diagnostic aid.

Finally, an emergency service is one of the places where training of medical students in the early diagnosis and adequate management or referral of problem drinkers could yield more clear-cut benefits. The study provides research for a medical education project currently under way.

Casualty Statistics for Metropolitan Toronto and the Province of Ontario: Suggestions for Research on the Alcohol Dimension

Norman Giesbrecht and Honey Fisher

Trauma is a frequent occurrence in modern social life. Alcohol is implicated in trauma, but it is not clear what is meant by the term "alcohol-related trauma." By focusing on the alcohol dimension there are implications for selecting etiological factors and prevention agenda. The etiological role of alcohol is clearer and more prominent with regard to cirrhosis than is the case for traumatic episodes related to drinking. Chronic alcohol-related conditions such as cirrhosis are heavily influenced by the volume of alcohol consumed, and therefore more closely linked to the rate of consumption in a society. Acute traumatic complications are more closely linked to drinking style and consumption on a particular occasion and thus may not covary with the overall rate of consumption.

This paper examines the prevalence and types of casualties via official statistics and proposes steps toward a more comprehensive epidemiological study of alcohol and trauma. A number of questions relevant to researchers, clinicians, and policy-makers are proposed to further examine the area of alcohol and trauma. Aggregate data from mortality statistics, hospital morbidity figures and police records from Metropolitan Toronto and the Province of Ontario are summarized. Data are presented by sex, age, year, and type of injury or death, with ratios of morbidity to mortality noted for causes where similar classifications are used.

It is proposed that one would expect to find a relationship between aggregate consumption and casualties since high-risk behavior, even by novice drinkers, is more likely to occur on a per capita basis in wetter than drier contexts. Also, in the wetter contexts, where there are multiple accepted uses of alcohol and integration of drinking into everyday activities, the confounding effects of alcohol in work, leisure, and recreational occasions are likely to be more pervasive. Finally, one would expect that in jurisdictions with a high rate of consumption and a concomitantly high proportion of heavy consumers with an above average risk of casualties, elevated rates of casualties would be evident. However, drinking patterns may

confound relationships at the aggregate level between rate of consumption and casualties; for example, jurisdictions with an average rate of consumption may have a high rate of alcohol-related casualties arising from the strong association of alcohol with heavy explosive consumption and risk-taking behavior.

Alcohol-Related Casualties in the Sudan

El-Tigani A. Hammad

The Sudan is a predominantly Muslim country of Afro-Arab nature--geographically, ethnically, and culturally. This paper presents the features of alcohol and its problems in this country. The plethora of research papers on the subject over the last three decades agree with the view that alcohol was not a problem for Northern Sudan. However, more recent research and clinical experience show that the size of the problem in the country is by no means negligible, as it presented as a major health and social problem among males in Khartoum Province. This situation, however, has not led to the formation of any specialized helping agency.

In 1983, a historic decision was taken by the government. Prohibition of alcohol was announced with an immediate ban on its production and import. Dealings in alcohol were stopped in hotels, restaurants, shops, and public houses, and the few breweries in the country were closed. Currently, the availability of alcohol is seriously limited. Despite the reduction in the clinical load of alcoholics, other problems have arisen in the few who have persisted in drinking. It now takes more effort and money to obtain alcohol from the black market. The "alcohol" obtainable is likely to be adulterated with toxic and sedative substances leading to poisoning and overdose. Nevertheless, alcohol-related problems and casualties have been cut back seriously.

There are no reliable statistics on the prevalence of alcoholism in the Sudan. The problem does not seem to be a priority and therefore alcohol-related services and training have not been established. The casualty-reporting agencies that keep records with some information on alcohol-related problems are very few. The secondary role of alcohol and its indirect involvement in casualties is generally not documented so that such information is deficient. The limited information on alcohol-related problems curtails an analysis of the relationships between casualties and alcohol in the Sudan.

Everything a Policy Adviser Wanted to Know But Casualty Statistics Failed to Reveal

David V. Hawks

Critical to policy formulation in the alcohol field is an understanding of the role of alcohol in casualties. While the attribution of causality in this area is extremely difficult, it seems likely that the role of alcohol in a number of casualties is, at least in many constituencies, greatly underestimated. This frequent failure to acknowledge the role alcohol plays in events is itself an impediment to the formulation of appropriate policy with respect to alcohol and the recognition of the true extent of the problems associated with its use.

That this fear is not a convenient exaggeration of those who wish to impose neo-prohibitionist control polices is suggested by the finding that systematic, if shorter-lived, inquiries result in a greatly increased detection rate of alcohol as a contributory cause. This finding suggests that in normal circumstances we greatly underestimate the contribution alcohol makes to a whole host of events.

The fact that such data are not usually collected contributes to the lethargy of governments in this area. Their collection would at least contribute to the documentation of harm associated with alcohol use. At present, the benefits of alcohol use are frequently seen to outweigh its costs, in part, one suspects, because the benefits are more readily and routinely identified.

This paper examines a number of initiatives or trends (not all of them the result of government policy) occurring in Australia, the impact of which should be reflected in casualty statistics:

1. The stabilization of per capita consumption in Australia, which masks the diminution of beer drinking among men, the substitution of wine, and, in particular, the increased consumption by women.
2. The substitution of lighter white wines for red and fortified wines and the introduction of reduced-alcohol beers, which for the first time have had significant market penetration.

3. The introduction of "high profile" random breath testing in some Australian states and the enactment of legislation requiring even lower blood alcohol levels in probationary drivers.
4. The increasing tendency for drinking to occur in domestic environments in contrast to pubs or clubs, resulting not only in changes in the environment of drinking but also the society of drinking.
5. The attempt to identify alcohol-related problems earlier and to make intervention regarding such problems more accessible and acceptable.

While a number of these trends have not proceeded from any policy initiative (that is, policy initiative emanating from health concerns), it is reasonable to suppose that they will be accompanied by changes in the incidence and prevalence of alcohol-related casualties. The challenge presented to those concerned with such matters is to devise means of recording the contribution alcohol makes to a whole variety of events with a view to rendering policy in this area a more rational process.

Alcohol-Related Casualties in Africa

Alan Haworth

There is very little information available concerning patterns of drinking and alcohol-related problems of any kind in Africa. The earlier anthropological literature was mainly descriptive, and reviews of medically oriented studies published in the mid to late 1970s mention papers that are mainly anecdotal and that contain few statistics. Most descriptions of alcohol-related problems focus upon "alcoholism" or "alcohol psychoses", and wide variations in incidence rates are reported--very low in some West African countries and as high a rate of alcoholism as 27% in males and 24% in females in Kenya.

There are two main sources of information on alcohol-related accidents and injuries: the police and health authorities. A number of studies on post-mortem blood alcohol concentrations have shown very high levels (above 150 mg/100 mL) in one-quarter to one-half of all cases. These studies have shown that pedestrians and cyclists make up more than half the road traffic accident victims. But apart from special studies, returns from health institutions rarely make any reference to alcohol. These returns, however, do show that road traffic accidents are not the main causes of injuries, although they are reported more frequently when the victim has died.

A major factor that distorts comparisons of mortality and morbidity rates in Africa with those of countries with highly efficient communications and transport and accident services is the greater chance of victims dying in Africa. Additional distortions are also present when police sources are used; statistics on the types and seriousness of injuries and whether alcohol was apparently a factor tend to be unreliable. Police statistics from a number of African countries report alcohol as a factor in road traffic accidents in about 1% to 10% of cases--surprisingly low figures. Whereas medical sources provide information on injuries from all types of cause without usually mentioning alcohol as a factor, the police note alcohol somewhat more often but usually only in relation to road traffic accidents. Yet injuries due to falls, burns and scalds, and interpersonal violence are far more common.

Other alcohol-related conditions presenting at accident departments include alcoholic hypoglycemia, other acute medical and psychiatric conditions (alcoholic hallucinosis is common in some African countries), and industrial injuries. There are, so far, no reports from Africa linking alcohol with parasuicidal acts. Children

and adolescents form special "at risk" groups because so many are involved in street-trading in crowded city streets in some countries, or are victims of assault or neglect, and because of the ready availability of alcohol to young people in some countries.

Since statistics thus far available are so poor in quality, there is a good case for carrying out special studies. Such studies may, however, be difficult because of the heavy workload carried by many medical facilities in Africa and the consequent lack of time for staff members to make the necessary observations. Some studies have already revealed discrepancies between physicians' estimates of intoxication as compared with other measures. Even when physicians were especially asked to indicate blood alcohol levels, the non-report rate in one study was 10%. In countries with young populations, alcohol-related injuries and acute medical conditions are likely to form an important part of total morbidity, and hence accurate data would also be useful in actual medical management. Attention could be focused on repeat-attenders with different (new) alcohol-related injuries, who may be developing other alcohol-related disabilities that could be prevented by early intervention. Despite the many difficulties, efforts to improve reporting systems in accident departments in Africa will prove to have been worthwhile.

Accidents and Injuries Among Treated Alcoholics and Their Families: Use of Health Insurance Records from the State of California and United States Government Employees

Harold D. Holder

Studies have shown that prior to alcoholism treatment for the alcoholic, the total family (including the alcoholic him/herself) consumes health care at a rate that is two to three times higher than comparable families of similar size, ages, and gender mix. The purpose of this paper is to assess the role of alcoholism in the costs of injuries and accidents. Findings from two study groups are presented: one with the public employee health insurance plan of the State of California and one with federal employees of the U.S. Government.

For the public employees of California, the number of accident/injury events per person (according to ICD codes, 8th Edition) and an estimated annual number of accident/ injury incidents per 100 persons were calculated. Alcoholics incurred fractures at a rate over five times that of other family members. The rate of internal injuries for family members is close to zero. Alcoholics have more serious injuries than other family members in that other family members have superficial injuries (small cuts, bruises, etc.) at a rate of 16 per 100 persons while alcoholics incur superficial injuries at an annual rate of only 4 per 100.

Members in the second study group are any enrollees with the U.S. Federal Employee Health Insurance Program, Aetna Life and Casualty Company, who received alcoholism treatment any time during the four-year period 1980-1983. An additional age-stratified group of families with no alcoholic members was randomly selected as a comparison group.

The estimated pre-and post-treatment annual accident rates per 100 for alcoholics are 63.6 and 42.6 respectively. Comparing the annual injury-producing accident rates per 100 by age and by gender for alcoholics, other family members, and members of the comparison families shows that they are slightly higher for

males between 35 and 65 and significantly higher during the retirement ages, 65 + . The age/gender categories for those under 35 have small cell sizes and are less generalizable than the age groups 35 + . These rates for these age/sex groups are substantially higher than those for the comparable members of non-alcoholic comparison families as well as other (assumed to be) non-alcoholic members of their own families. Across all ages, alcoholic males have higher accident rates (44.5) than their male counterparts in their own families (34.7) and the comparison families (23.9). Likewise, female alcoholics have higher rates (51.6) than female members of their family (23.7) and the comparison families (25.6). For the entire family with an alcoholic member, the four-year annual average rate per 100 persons is 40.1 compared with about 26 for the families with no alcoholic members.

Overall, alcoholics appear to have injury-producing accident rates that are from about one-third to two times that of non-alcoholics. This difference in rates is less after alcoholism treatment initiation but does not converge to the level of the non-alcoholics until three years (possibly more) after treatment initiation. These injuries appear to be primarily fractures more than any other type of injury. Contrary to popular beliefs, alcoholics do not appear (at least in these two study groups) to have higher rates of burns than non-alcoholics.

When differences in injury rates by gender and by age group are examined (to the degree that the cell sizes are sufficient to permit reasonable inference), female alcoholics have higher injury rates than males in general and by age group. Such results suggest that while some of the injury rates for alcoholics is a function of age, the observed differences in rates appear to be the consequence of the alcoholism condition.

In each study, the lower rates of injuries for alcoholics following treatment support treatment as a means to reduce the risk of accidents. However, as the post-treatment risk rates are not equal to the rates of non-alcoholics, additional risk-reduction measures should also be considered.

Alcohol Methods in Crisis and Research

Bhushan M. Kapur

There are various reasons why alcohol measurement is done. It is the most commonly observed drug in patients presenting in the emergency rooms of hospitals. The presence or absence of alcohol can have major prognostic and diagnostic implications. In a clinically compromised patient, low blood alcohol level (BAL) would indicate to the attending physician that further investigation is necessary. An underlying concurrent disease, a head injury, or the presence of another drug may be the cause of the compromised clinical condition. If BAL is high, then alcohol may be the only potential cause of the clinical condition. In either case, the presence and the approximate quantity of alcohol is an important clue in the management of the patient. Alcohol analysis is particularly important when the patient is being treated with alcohol sensitizing drugs such as calcium carbimide or disulfiram.

There are two factors that should be considered before analysis: 1) body fluid and 2) method of analysis. Breath, blood, and saliva levels reflect the current BAL, whereas urine reflects the average BAL between voidings. In programs requiring monitoring of alcohol use, urine is probably the better specimen.

Since the introduction of the micro method for alcohol analysis, many new methods and modifications have been published. The distillation/oxidation methods are generally nonspecific and few centres use them. Enzymatic and gas chromatographic procedures are most commonly used and are specific for alcohol. The most recent introduction is the alcohol dipstick method. This method not only is sensitive but also requires no instrumentation. The alcohol dipstick can be used for the detection of alcohol in all body fluids. It can provide results in ranges of pharmacological-toxicological interest. Studies in the "non-laboratory" clinical environment have shown this to be a viable method.

Towards an Epidemiology of "Alcohol-Related" Casualties: A Balancing Act

Johannes de Lint

This paper discusses the feasibility, from a scientific perspective, of providing better data on the prevalence of "alcohol-related" casualties and avoiding the risk of alcohol bias. Research should be directed to a better matching of cases and controls taking into account any variable other than alcohol use that may be suspected to have also contributed to the accident. Without such matching, and without exhausting all other etiological possibilities, the calculation of the relative risk of the different types of accidents deemed to be alcohol-involved by varying amounts of alcohol intake, merely strengthens the alcohol bias in this line of research. As much as one should seek to document the "alcohol involvement" in problems of health and behavior, one should try also to prove one's "anticipations" regarding the etiological relevance of this factor to be false. To balance the epidemiological act, more studies ought to assess the statistical significance of the "alcohol involvement," the extent to which this involvement exceeds expectation. In addition, the question as to how other factors may have contributed to the problem at hand should be more vigorously pursued. Only in cases where the etiologies have been reasonably well charted should we proceed to a calculation of the risks incurred at varying amounts of intake. Finally, we should scrutinize our lengthy experiences with "alcohol-involved" chronic diseases, notably liver cirrhosis. We should note how, in these instances, "alcohol-involvement" was established, and then consider how work progressed from "alcohol-involvement" to "alcohol-caused." In considering both chronic and acute complications of alcohol, other etiological pathways must also be explored.

Alcohol Consumption and Emergencies: An Emergency Room Study

Enrique Madrigal

The extent of alcohol involvement in casualties seen in emergency departments of hospitals in Costa Rica is not known. Consequently, the aim in the design and development of the present study is to obtain relevant data on the presence of alcohol-related problems among medical and surgical emergencies in a general hospital in San José, Costa Rica. The total number of cases were 2,130 patients attending the emergency room of Hospital San Juan de Dios during a 10-day period during the month of June in 1985. A brief questionnaire was administered to the patients reporting on the presence or absence of alcohol ingestion as it related to the accident. Specific findings, in terms of presence of alcohol intoxication and/or alcohol as a cause-related agent, revealed that 13% of the cases were positive in this respect. Alcohol, as an underlying factor or etiological agent, was found in 11% of the cases. Alcohol involvement was noted in 21% of the male cases and only 4.4% of the female cases. The study points to a need for the health system to develop appropriate instruments for data collection and the detection of alcohol as an underlying cause in hospital emergency room consults. Furthermore, medical staff should emphasize the importance of early detection and referral of alcohol-related problems.

Alcohol Related Casualties in Latin America: A Review of the Literature

Maria Elena Medina-Mora and Laura González

The purpose of this paper is threefold: (1) to review the existing literature on alcohol-related literature in the region; (2) to conduct an in-depth analysis of the casualty registration systems; and (3) to examine the extent of alcohol-related problems in Mexico. The published literature on this topic in the region is scarce and in many cases difficult to access. The few studies that were available were divided into four major groups: (1) alcohol use at the time of the event; (2) drinking history and drinking problems of persons involved in the serious events; (3) proportion of heavy drinkers who experience serious events; (4) estimations of presence of alcohol in populations at risk.

From the total of the available studies, 33 corresponded to the first group, three papers dealt with the second group, and two and three papers respectively were in the third and fourth groups. Crime and traffic accidents were the casualties most often reported (11 and 10 studies respectively). Other types of casualties reported were suicides (eight studies), arrests (five studies), results of autopsies or rates of hospitalizations (three), and family violence and divorce (three). Only one study reports rates of alcohol involvement in accidents other than automobile. Emergency room studies were not very common. The rates reported in the articles reviewed were obtained either from official statistics or from special studies, and show great variation, both between and within the different countries. The presence of alcohol in persons accused of crime or in traffic accidents, for example, varied between 19% and 52% and between 4% and 70%. These variations are related to the source of definition of the event and type of population covered. Unfortunately, this information is not included in the reports and thus general conclusions are difficult to draw. The highest rates of alcohol-related casualties were reported in Mexico and Chile; these two countries also have the highest rates of mortality due to cirrhosis of the liver (22.7 and 22.6 respectively in 1978).

Reporting systems were only analysed for Mexico, where seven such systems exist. These systems are acceptable in terms of the type of data gathered and institutions included. Unfortunately, in only few events is the presence of alcohol recorded. Recording of casualties is possible through improvement of the existing systems.

Abstracts

When the casualty rates reported in the system were compared with those drawn from the same population through specific studies, important variations are found. For instance, the official information system reported that in 1979, the proportion of suicides committed under the influence of alcohol was 2%, but when the files were reviewed, it was found that in 28% of the cases, blood alcohol levels were higher than 100 mg. Rates of alcohol involvement in traffic accidents also varied from 16% (reporting system) to 40% (direct interview).

Casualties in Poland: Focus on Alcohol

Jacek Morawski and Jacek Moskalewicz

This paper presents statistical data on various types of casualties including crime, traffic accidents, labor accidents, poisonings, and suicides. The basic problem in the study of alcohol-related casualties in Poland is access to adequate information. Published statistical data are scarce, especially where alcohol is involved. Data on the involvement of alcohol in casualties are not always published even if they are aggregated in an appropriate statistical system. Other kinds of statistics, even if they include data on alcohol, may be prepared for the exclusive use of institutions concerned. Long-range analyses of these statistics often encounter serious obstacles since the data for particular years are not always comparable owing to a variety of factors including changes in reporting systems, legislation, definition of what a casualty is, and methods of measuring alcohol involvement. Lack of continuity in many statistics make it difficult or impossible to analyse changes in the prevalence of casualties in correlation with changes in alcohol consumption figures. This adds considerably to the complexity of assessment of the functioning of a preventive system. In spite of lack of suitable statistics, the role of alcohol in certain casualties is overexposed. Causal links between alcohol and casualties are emphasized, although the character of this relationship is at least questionable. This "alcoholization" of the causes of casualties results in their origins being located on the individual level instead of the social or environmental level. Consequently, the field of preventive operations is narrowed out of its due proportion.

Alcohol-Related Industrial and Recreational Accidents: What Kind of Research Is Needed?

Richard Müller

Accidents should not be considered as singular events but rather as sequences of incidents in the interaction between man, machine and environment. Systems engineering in accident research has been quite successful in modelling the interplay of conditioning factors, system failures, and consequences of events in regard to the three main systems involved. From a social-psychological and particularly from a sociological point of view, however, most of these models suffer from severe shortcomings. First, the models conceptualize accidents as unintended, implying that every individual behaves in a rational manner and tries to avoid accidents. Second, they consider the risk acceptance level--one of the crucial factors in the accident process--as a given entity not taking into account the creation of individual meaning of risk and the potential positive function of risk-taking. Third, they generally have a limited scope in defining the environmental system. The following topics for future research have been identified:

1. Enlarge the almost purely cognitively oriented approach of information processing in potentially dangerous situations by introducing affective states of the individual.
2. Study the individual meaning of risk and develop strategies to teach people about the personal consequences of risk.
3. Study, via quasi-experimental design, the conflict between the need for security and the need for achievement and the corresponding acceptance of risk in peer-group situations when alcohol is and is not present.
4. Study ego-defensive and ego-protective causal attributions in alcohol-related accidents at work, at home, and during sporting events.
5. Conduct "on-the-scene investigations" taking into account not only the immediate preconditioning factors, but also their connection with factors of the immediate environment.

Finally, it is stressed that in the initial stages, national and international standards for reporting industrial and recreational accidents need to be established and, consequently, corresponding meaningful data systems will be implemented.

Alcohol-Related Casualty Statistics in Australia

Robyn Norton

Data on alcohol-related casualty mortality in Australia are available through the annual collection of mortality data undertaken by the Australian Bureau of Statistics. For a range of deaths, a conservative estimate or "index" of the proportion of deaths in which it can be assumed that alcohol has played a significant role has been calculated. In 1981, deaths from alcohol-related poisonings, falls, drownings, homicides, and suicides represented 17% of the total deaths that were attributed to alcohol, and 0.5% of the total deaths for that year.

Statistics on hospital discharges are not collected on a national basis in Australia, but are the responsibility of individual states and territories. To date, no attempt has been made to develop any "indices" of alcohol's involvement in selected hospital admissions. Statistics on admissions to hospital casualty/emergency departments can be accessed through individual hospital morbidity collections. The only published study investigating alcohol's involvement in casualty/emergency department admissions suggested that, excluding persons involved in motor vehicle accidents, 24% of persons had been drinking prior to admission.

In addition to the above data collections, a number of systems provide information on specific casualties. Although data on industrial accidents are collected nationally, the collection system is deficient in identifying those accidents that are alcohol-related. Data collected by the Commonwealth Department of Aviation has implicated alcohol in 0.6% of all aviation accidents occurring since 1969. Although no national data system exists on drownings, a unique and comprehensive system exists on all fatal drownings occurring in and around the Victorian town of Geelong. Alcohol had been consumed prior to death in 45% of all "accidental" drownings occurring over the 25 years from 1959 to 1983.

A National Poisons Case Reporting System was established by the Commonwealth Department of Health in 1966. Data are collected on all poisonings reported to the Poisons Information Centres in each state/territory and on poisonings presenting to hospital casualty/emergency departments. Currently only 15% of hospitals contribute to the system.

Within each state and territory, police and court statistics are published annually. Detailed analyses of these statistics, including consideration of alcohol involvement, are not undertaken routinely, but are undertaken by groups such as the New South Wales Bureau of Crime Statistics and Research and the Office of Criminal Statistics in South Australia. Alcohol involvement in homicide, domestic assault, and sexual assault has been investigated by these groups. However, as reporting of alcohol involvement is not mandatory, its true extent cannot be determined. In addition to the research undertaken by these groups, numerous individuals and organizations have investigated the role of alcohol in both attempted and completed suicides. Alcohol has been found to be associated with a higher percentage of attempted compared with completed suicides.

Endorsement for the establishment of a national drug-related data collection system, at a Special Premier's Conference on Drugs, held in Canberra on April 2, 1985, suggests that the potential now exists for improvements in these existing systems, for the establishment of new systems, and for detailed analyses of all available data.

Alcohol-Related Casualties: The Nigerian Experience

A.O. Odejide, B.A. Ikuesan, and J.U. Ohaeri

Currently available data show an increasing trend in alcohol production and pattern of use among Nigerians. However, since there is no regular reporting system for all direct alcohol-related casualty statistics in Nigeria, skeletal research data from retrospective and prospective studies and population surveys were examined in order to provide some picture of the situation in Nigeria. The review of the retrospective clinical studies highlighted essentially psychiatric and social problems associated with alcohol use/abuse. Conversely, a prospective study of alcohol-related casualties conducted in hospital emergency units identified non-psychiatric alcohol-related casualties such as trauma from road traffic accidents, assaults occasioning harm, home accidents, gastrointestinal complications, and deliberate self-harm. The constraints on our ability to determine the alcohol levels in body fluids are emphasized. The implications of the findings are discussed especially with regard to the need for early identification of cases, formulation of preventive measures, culturally oriented treatment approaches, and systematic data collection, especially for non-psychiatric alcoholic complications.

Finnish Statistics on Alcohol-Related Accidents

Esa Österberg

The paper concentrates on three chief issues. First, it looks at how accidents are recorded in Finland; second, it examines accidents in the light of current research findings; and third, it discusses the role alcohol plays in accidents.

Finnish accidents are registered by numerous agencies. Each agency, however, records accidents for purposes of its own; consequently, the items recorded and the coverage they represent vary considerably.

Records of causes of death are currently kept in accordance with the eighth revision of the International Classification of Diseases (ICD). A computerized register of discharges from all hospitals has been in operation since 1967. There is only one hospital in Finland that maintains a continuous register of the treatment given to ambulatory patients. Two registers of Finland's Social Insurance Institution contain diagnostic data: the work disability benefits, and the rehabilitation register. The National Board of Labor Protection has registered industrial accidents since 1976. The Central Statistical Office keeps a register of all traffic accidents that come to the attention of police. The insurance companies also keep a register of traffic accidents; their register is based on claims for compensation made by policyholders. There is also a register of accidents of privately insured persons, and the Finnish Poison Information Centre keeps track of its own activities.

In 1980, some 11% of all mortalities amongst Finnish men and some 5% amongst Finnish women were due to accidents. Approximately 80 out of every 100,000 Finns met their deaths through accident in 1980. Between 1969 and 1980, fatal traffic accidents became far less common. The number of deaths due to poisonings went up sharply between 1969 and 1980. Over the last 30 years, the number of children dying as the result of accidents has fallen noticeably. The Finnish suicide rate, on the other hand, has gone up steeply and nowadays about twice as many people take their own lives as die in traffic accidents.

About 7.5% of all treatment given in Finnish hospitals was for victims of accidents and injuries. In the early 1980s, about 700,000 accidents required medical

attention annually: some 70,000 of these were traffic accidents, 180,000 industrial accidents, 150,000 home accidents, and approximately 300,000 leisure-time accidents.

In recent years, approximately 30% of the adults who received treatment for injuries resulting from accidents and the like at outpatient clinics had been under the influence of alcohol at the time. About one-half of the accidents during night-time hours or on Saturdays happen to people who have been drinking. Three out of every four accidental fatal poisonings are due to excessive drinking. More than half of all people who drown are under the influence of alcohol. Two-thirds of all persons wounded in violent assaults are inebriated when the incidents occur.

Home accidents and other mishaps during leisure time constitute a substantial proportion of overall accidents, yet the present statistical and registration practices do not adequately focus on them. The same holds true for alcohol's role in casualties. One of the most important tasks for the future is therefore to develop procedures that could elucidate alcohol's role in accidents, and especially home accidents.

Alcohol and Accidents: Biological Markers of Chronic Drinking among 4,796 Casualties in a French National Survey

**Laure Papoz, Jacques Weill, Claude Got, Jean L'hoste,
Yvon Chich, and Yves Goehrs**

Chronic alcohol consumption represents a major health problem in France. Traffic accidents are the primary cause of premature mortality, leading to about 11,000 deaths each year. This situation led the French government to initiate a nationwide epidemiological survey to assess the proportions of occasional and chronic drinkers among traffic casualties. The study was subsequently extended to include all kinds of accidents.

Between October 1982 and March 1983, the characteristics of 4,796 victims recruited in the emergency units of 21 hospitals were recorded. Systematic blood sampling was performed to determine the blood alcohol concentration (BAC), and two markers were noted of chronic alcohol consumption--gamma-glutamyl transferase activity (GGT) and mean corpuscular volume (MCV).

Alcohol was present in the blood of 35% of the injured, at a level exceeding 0.80 g/L, in one in four men and one in 10 women. The highest proportions of those with elevated BAC had been injured in fights, home accidents, and traffic and pedestrian accidents and were unemployed, divorced, or widowed men. In comparison with a reference population of healthy subjects, GGT and MCV were found to be markedly higher in the emergency victims, indicating that most of the intoxicated subjects were probably chronic drinkers. This was confirmed by discriminant analysis, resulting in a global proportion of 30% of chronic drinkers among casualties. Consequently, it seems that in France, the policy for accident prevention should focus at least as much on chronic as on occasional drinking.

Remarks on Causal Inferences about the Role of Alcohol in Casualties

Kai Pernanen

Aspects of causal relationships between alcohol use and casualties or casualty-related behaviors are discussed on the basis of the empirical evidence of probable positive correlations. Before any causal analyses or causal interpretations based on aggregate-level co-variations (such as statistical data on alcohol involvement in different types of casualty events) can proceed, at least two methodological preconditions for establishing co-variation have to be met: (1) checks, controls, or assessments of types of bias that would lead to an overestimation (or under-estimation) of the involvement of alcohol and (2) null hypotheses (often in the form of relative risk figures) should be established. These preconditions are often overlooked when attributions of a causal role to alcohol are made. The paper provides illustrations of the use of available statistical information to establish relative risk figures with regard to alcohol-related casualties and other alcohol-related problems.

In accounting for the correlative relationship between alcohol use and casualties by means of causal processes, it is important to distinguish between the different empirical referents of the concept "alcohol" as it is used in discussions of aggregated data. Among the most central of these referents are per capita alcohol consumption, amounts of alcohol consumed per event, the social and ecological context of drinking, etc. These aspects of the substance alcohol have been the subject of numerous special studies on the individual level, but the linkages to aggregated empirical findings have not been analysed to the extent possible and necessary. The different referents of the "alcohol" concept, and consequently the different causal processes involving alcohol in casualties, are unequally distributed between different populations and subpopulations.

It is argued that the causal relationships will realistically have to be explicated in the form of contributory cause models that state whether alcohol has significantly increased or decreased the risk of casualties or casualty-related behaviors. On the level of the individual casualty events this is the equivalent of stating whether the casualty would have occurred depending on whether alcohol was used preceding the event.

In ascribing causality there exists a certain pressure towards parsimony. This tendency sometimes leads to premature causal ascriptions. This is true when a conveniently labelled property is used in the explanations, such as in the attribution of "disinhibiting" processes to alcohol. Instead, the aggregate-level relationships between alcohol use and different types of casualties are probably the outcome of many different processes on different levels of inquiry.

Typical alcohol use variables often are of a fairly high methodological level. Many central measures are ratio scale variables, such as per capita consumption figures, proportions of consumers in the total population, proportions of casualty events in which alcohol was present, and amounts consumed at one sitting. Consequently, there is a tendency to consider predominantly linear models in the accounting of casualties by means of alcohol use variables. However, different types of casualties are conditional on various causal processes involving social interaction and social definitions of the drinking individual and others in interaction situations. These predominantly nominal scale variables and qualitative causal processes are the outcome of cultural transformations of the "objective" measures of alcohol use. Inter-personal violence and risk-taking behavior leading to drownings and falls are cases where these social processes typically occur.

Interpersonal differences in proneness to casualty-producing behavior in connection with alcohol use should be examined and the atomistic focus on separate casualty research should be avoided. Generally, a conscious effort should be made to coordinate different level studies: aggregate/epidemiological, physiological (e.g., psychomotor effect), psychological (e.g., cognitive alcohol effects), and behavioral (e.g., risk-taking tendencies related to alcohol use), as well as considering social definitions and changes in these relevant social interactional processes, and the phenomenological impact of alcohol in different cultures on definitions of self, situation, and other interactants, etc. Communication between the different levels of causal analysis and theory should be open, and definitions of research problems should be attempted where the points of view of more than one discipline or subdiscipline are taken into account.

Research into and Registration of Alcohol-Related Nonfatal Casualties in Finland: The Need for Improved Classification

Kari Poikolainen

In Finland in 1972, alcohol-related casualties accounted for about 0.5% of all hospital days. Clinically, alcohol is detected by evaluating the degree of inebriation with the help of a semi-quantitative scale. This is often followed by blood or breath alcohol measurement. In 1973, clinical inebriation was recorded in 13.5% of the patients of the emergency department of Helsinki University Central Hospital. Of patients with alcohol in their blood, 50% were found to be clinically inebriated; less than 0.5% of patients with no alcohol in their blood were considered inebriated (false positives). In a case-control study, the relative risk of pedestrian accidents due to falls and hits by motor vehicles was found to be approximately exponentially related to the blood alcohol level. Compared to pedestrians with no alcohol in their blood, the relative risk associated with a blood alcohol level of over 0.2% was 29. Based on risk ratios, the proportion of nonfatal casualties due to alcohol was estimated at 18% in the 1970s.

Improvements are needed in the National Hospital Discharge Register to facilitate its use in research into alcohol-related casualties. Blood alcohol levels should be registered and classifications of diseases and injuries improved. It is argued that codes of alcohol-related conditions in the present Ninth Revision of the International Classification of Diseases should be simplified.

Categories "Alcohol dependence syndrome" (303) and "Nondependent abuse of alcohol" (305.0) should be combined. A new category "Alcohol inebriation" should be introduced to register the behavior symptoms of alcohol intoxication. More exact criteria for the use of the category "Toxic effect of alcohol" (980) as the principal hospital diagnosis and as the underlying cause of death should be given. "Excessive blood level of alcohol" (790.3) is superfluous and should be deleted. Finally, a totally new code for the external cause of injury should be developed.

Alcohol Consumption, Casualties, and Traffic Accidents in Spain

**Joan Rodés, Albert Parés, Joan Caballería,
Miguel Rodamilans, Alvaro Urbano, and Luis Bach**

This study was based on an epidemiological survey to investigate whether accidents, particularly casualties and traffic accidents, are related to alcohol consumption in an urban area of Spain.

Eight hundred and fifty patients who came to the emergency room of the Hospital Clínico y Provincial de Barcelona between February 12 and May 12, 1985, were questioned by two trained nurses about their amount and type of alcohol consumption. In addition, blood alcohol concentration (BAC) was determined by enzymatic assay in 88 patients (10.3%). Patients were divided into five groups according to the reason for admission to the emergency room: casual accidents (52.5%), traffic accidents (15.7%), work-related accidents (6.7%), medical diseases (13.4%), and a miscellaneous group (11.9%).

Fifty-seven percent of the patients were males. The age of the patients ranged from 14 to 92 years ($M = 41.5$, S.D. 19.6) with most between 21 and 40 years (43.5%). The mean age of patients injured in traffic accidents was significantly lower than the ages from the other groups ($M = 31.9$, S.D. = 15.2 vs. $M = 43.9$, S.D. = 20.5, $M = 41.2$, S.D. = 19.4, $M = 42.7$, S.D. = 19.4, $M = 42.2$, S.D. = 19.8). In traffic accidents, there was a net majority of males. Eighty percent of the patients were drinkers (65% daily and 15% occasional). The highest percentage of drinkers was observed in patients with work-related and traffic accident injuries (92.9% and 88.9%, respectively), but there were no significant differences in the number of drinkers among the five groups. The daily absolute alcohol intake was 35.4 ± 35.9 grams (range 5-334 g). About half (54.9%) of the patients drank less than 30 g/day, 22.5% between 31 and 50 g/day, and 17.3% more than 50 g/day. The type of alcoholic beverage most frequently consumed was wine.

Fifteen of the 88 patients studied had alcohol in their blood (17.0%). Ten had BACs higher than 0.8 g/L and the remaining five had BACs between 0.1 and 0.8 g/L. There were differences among the groups with regard to the presence of alcohol in blood. Alcohol was detected in the blood of 42.1% of traffic accident

cases and 22.6% of casualties, but only in 4.3% of patients attending because of medical disorders and in 5.6% of those from the miscellaneous group.

In conclusion, most of the patients who attended the emergency room consumed alcoholic beverages regularly, and although the frequency of drinkers was rather similar in all groups with different types of lesions, there was a higher incidence of drinkers in patients with traffic and work-related injuries. In addition, almost a fifth of the patients attended in the emergency room had alcohol in their blood. The fact that the highest BACs were observed in traffic accident and casualty patients suggests that the recent alcohol consumption may have been partly responsible for these accidents.

Alcohol and Trauma: A Review of Emergency Room Studies

Judy Roizen

Through reviews of numerous studies, this paper examines, via the window of the emergency room, the role of alcohol in causing traumatic events. Trauma is a social and medical problem of great proportion in both developed and developing countries, yet it has received relatively little research attention except for traffic accidents. In most developed countries, trauma is the leading cause of death between the ages of one and about 40. Trauma in these countries is the fourth or fifth leading cause of death in the general population after heart disease, stroke, and cancer. Studies of alcohol's involvement in accidental death occurred in any number only from the late 1940s in the United States. The past decade has seen a developing interest in alcohol's involvement in injury and death.

A majority of the studies reviewed here call for more comprehensive measurement of alcohol presence at admission to the emergency room. In the absence of resources for laboratory tests, clinical observations have given a reasonable estimate of patients who "have been drinking." Most data needed to estimate the number of traumatic injuries and deaths are collected for purposes other than research; typically they are part of the routine record-keeping of state and local agencies. Although the costs for collecting primary data are avoided, there is the disadvantage of having to rely on information generated by others for other purposes. Consequently, use of secondary sources makes comparative analysis difficult. Review of more recent U.S. studies indicates that the alcohol variable is more accurately measured than was the case in earlier studies; however, the role of alcohol in causing traumatic events is still not clearly investigated. Practical and financial restrictions often hinder the gathering of substantial amounts of data that can yield more than simply alcohol presence in traumatic events. The need for better data on drinking histories of trauma patients and for control groups is emphasized.

This paper reviews research on the following topics: emergency room clientele; alcohol measurement in emergency rooms; magnitude of the problem; general emergency room studies; alcohol and head injuries; other injuries; motor-vehicle-related trauma; pedestrian trauma; falls; fires and burns; work-related harm; trauma related to fights and assaults; self-harm; and other traumatic events.

There are about 130 references as well as a number of tables drawn from key studies cited in this review.

Alcohol-Related Casualties in Mexico: Results of a Study

Haydeé Rosovsky

In Mexico, accidents and criminal behavior constitute an important public health problem. Among the main causes of death, we can find accidents and intentional wounds affecting primarily the young adult population. In the scarce official statistics available, an increase can be seen in those events where alcohol is involved.

The study was carried out over a one-month period at an emergency hospital and a police station. A sample of cases was selected in which the presence of alcohol was found by clinical examination and by questioning the subjects about alcohol consumption that day. A comparison or control group of casualties who had no alcohol on the day of the event was also selected. Of the 1,042 subjects entering either the hospital or police department, 206 (19.8%) were cases involving alcohol. Of these, 45.5% entered the hospital and 55.5% the police station.

All of the casualty cases (alcohol and non-alcohol-related) consisted mainly of young males (50% less than 25 years old), of low social and economic status in terms of schooling, occupation, and income. The principal reasons for entering the hospital in the alcohol-associated cases were intentional wounds (65%), fights, assaults, family quarrels, accidents (4%), and suicide attempts (3%); 11% had no clear cause. At the police station, the subjects entering after consuming alcohol were charged with inflicting wounds (26%), road accidents (15.5%), drinking in public thoroughfares (18%), public disorder or damaging property (29%), and robbery (14%).

Responses to a questionnaire by both the experimental and control groups indicated that the beverages they drank most frequently were spirits, beer, and pulque, in that order. Consumption was classified into low, medium, and high categories. Statistically significant differences in consumption of spirits were found between the experimental and control groups ($X^2 = 11.57$, $p < .01$). Generally, amongst the alcohol-related cases it was found that high consumption in all beverage categories prevailed. It was only in the alcohol-related casualty group that consumption of pure alcohol was reported (8%). In both groups the most frequent category of consumption was one to three times per month.

With regard to frequency of intoxication, 29% of the alcohol-related cases said they became intoxicated always or nearly every time they drank, while only 12% of the control group fit into this category. Although amongst the alcohol-related cases no significant differences were found between their usual consumption pattern and their consumption the day of the event, 60% said they were drunk when the event happened.

Alcohol-related casualty cases also reported consistently more problems in the past related to alcohol consumption, especially in relation to family and health.

Alcohol Intake and Related Problems of Patients Attending the Emergency Department of a Sydney Teaching Hospital

John B. Saunders

Evidence is accumulating that a high proportion of patients attending general hospitals have an underlying alcohol problem. The impact of problem drinking is particularly obvious in orthopedics, gastroenterology, internal medicine, and emergency services. Given that many acute illnesses and traumatic conditions are alcohol-related, the emergency department has been identified as a potentially useful point of contact for patients in need of alcohol treatment services. In light of the paucity of data on the prevalence of problem drinking among patients attending emergency departments and the role alcohol might play in the presenting problems, the present study aimed to determine the alcohol intake, level of dependence, and experience of psychosocial and physical problems (including trauma) of ambulant patients attending the emergency department of a Sydney teaching hospital. The survey was conducted as part of an international collaborative study, under the aegis of the World Health Organization, on detection of persons with harmful alcohol consumption. A particular interest was to identify early-stage problem drinkers and to establish whether an emergency department clientele was a useful target population for early intervention programs.

A random sample of ambulant patients, aged 18-55 years, attending the Emergency Department of Royal Prince Alfred Hospital between 8 a.m. and 8 p.m. from January 1984 to August 1985 was recruited. Each patient was interviewed by a medical officer using a questionnaire that consisted of approximately 150 questions on demographic and socio-economic characteristics, the level and frequency of alcohol consumption, intoxication, alcohol dependence, physical and psychosocial consequences of drinking, and whether they had previously received treatment for a drinking problem. Each patient underwent a clinical examination and had hematological and biochemical tests performed.

Three hundred and sixty subjects were interviewed. Thirty-four (9.4%) were lifelong abstainers or drank on no more than three occasions per year. Forty-two (11.7%) were known heavy drinkers or alcoholics. The remaining subjects, numbering 284 (78.9%) were termed "drinking patients," who were defined as current

drinkers but who had never been diagnosed as having an alcohol problem. Among the whole group, 49 men (21.5%) had an alcohol intake exceeding 60 g per day and 10 women (7.6%) had an intake of over 40 g per day; these levels confer a high risk of alcohol-related harm.

When the known alcoholics were excluded, 30 men (15.5%) and five women (4%) were in the high-risk category. Forty-one men (18.0%) and nine women (6.8%) had experienced two or more symptoms of alcohol dependence weekly or more often in the last year. Excluding the known alcoholics, there were 21 men (10.8%) and six women (4.8%) in this category. Thirty-two men (14%) and three women (2.3%) had injured themselves or others through drinking in the previous year; excluding the known alcoholics, there were still 17 men (8.8%) but no women with this history. A total of 89 men (39%) and 16 women (12.1%) had experienced at least one adverse consequence of drinking in the previous year, including trauma, problems at work, family problems, or legal problems. With the known alcoholics excluded, 62 men (32%) and 10 women (8.1%) had had such an experience.

These results indicate that 18%-39% of men and 7%-12% of women attending an emergency department have some problem with alcohol--either a high-risk level of consumption, features of dependence, or an adverse physical or social consequence in the previous year. When known alcoholics were excluded, there were still 11%-32% of men and 4%-8% of women affected. With this proportion of potential clients, the emergency department would seem to be an important site for early intervention programs. The feasibility of establishing such a program is currently being evaluated.

A Study of Alcohol Use and Injuries Among Emergency Room Patients

Cheryl J. Stephens

A study was undertaken at San Francisco General Hospital to examine the relationship between alcohol use and emergency room admissions. A probability sample of 2,516 patients was drawn of whom 1,896 were breathalysed and interviewed regarding alcohol use six hours prior to the injury or onset of symptoms. Of the sample 15% were found to have positive breathalyser readings. The proportion of positive breathalyser readings was significantly greater for those injured (23.1%) compared to those not injured (12.1%). This pattern was apparent in males but was not significant for females. Males were consistently found to have a larger proportion of positive breathalyser readings for both injured and non-injured at three levels (.01, .05, and .10) of breathalyser readings. A significantly larger proportion of both sexes reported drinking six hours prior to the injury than had positive breathalyser readings (40% of males and 35% of females). Positive breathalyser readings were more significantly associated with cause of injury than type of injury. The largest proportion of positive breathalyser readings by injury type was found for those with head injuries (35.3%), while the largest proportion by cause of injury was for those who were injured in fights or assaults (37%). These findings suggest that alcohol is associated with injuries for which treatment is sought in an emergency room, particularly among males.

Plans for Future Work

Models for Future Work on Alcohol's Role in Casualties

Robin Room

From the point of view of public health policy, work on alcohol's role in casualties has a double purpose: (1) to contribute information useful in managing and reducing the rate of alcohol-related casualties; and (2) to serve as a basis for creating the popular and political will for reducing the rate of alcohol-related casualties. The field of alcohol-related casualties itself provides a dramatic example of the potential role of new knowledge in creating a new consensus for public health action. Prior to the invention and diffusion of means of testing blood alcohol level in the 1930s, the common consensus among highway police and others involved in traffic accidents was that drunkenness was responsible for a very small portion of highway fatalities--certainly under 5%. With the new technology, it became apparent that the potential role of alcohol in traffic fatalities had been very seriously underestimated. The new knowledge gained with blood-alcohol testing technology in the long run created a powerful argument for public health action to reduce the alcohol-related road casualty rate.

While this double purpose needs to be kept constantly in mind, our attention in what follows will be focused on how to develop the knowledge that is potentially of immediate practical significance in prevention and service policy-making. We want to know more about the social and physical circumstances of alcohol's involvement in different kinds of casualties, with a view to intervening in the chain of events to prevent or mitigate the injury or damage. We want to know about the rates of and trends over time in alcohol-involved casualties, within the context of trends in casualty rates in general. We want to know about the differential distribution of alcohol-related casualties in segments of the population and by local geographical areas, as a basis for planning the distribution of both prevention and treatment services.

The following pages lay out some possible directions for future collaborative work within an international framework aimed at answering these and similar questions.

A. Analysis of Existing Data

Substantial energy has been devoted in recent years to reanalyses of published aggregate-level statistics on alcohol and casualties. The International Study of Alcohol Control Experiences (ISACE) (see: Mäkelä et al., 1981; Single et al., 1981) examined the interrelation among trends in alcohol control, alcohol consumption levels, and alcohol problems in recent decades, including available statistics on alcohol-related traffic accidents. A companion volume to the ISACE study gave special attention to alcohol problem statistics (Giesbrecht et al., 1983), and the recent Scandinavian Alcohol Statistics (SAS) project (see Österberg's paper at this meeting; also Ahlström, 1984) is carrying out a further cross-national comparative analysis, in the context of countries with unusually good health and social statistics. A substantial North American literature has charted the temporal relations between various alcohol intervention measures--lowering and raising the drinking age, toughening drunk driving laws, etc.--and alcohol-related road casualties.

Most such analyses have been limited to traffic casualties and to aggregate-level analyses because such data are the most readily available. In a few countries, Poland for example, statistics have also been available on alcohol-involved crimes such as homicide and assault, which imply casualties. As discussed below, general mortality statistics are almost useless for studying alcohol's role in casualties. The most useful aggregate statistics on alcohol's role in casualties, in fact, come from reporting systems based on police reports rather than health system reports. It may be worth examining whether multiple-cause analyses or mortality files have anything to contribute to an understanding of alcohol's role in casualties, but the International Classification of Diseases (ICD) categories and coding rules (discussed below) make the usefulness of such analyses doubtful.

There are some areas in need of further useful work in analysing aggregate-level data. Surprisingly little work has been done comparing the diurnal and weekly rhythms of drinking and casualties in the same population. Nor has sufficient attention been paid to exploring divergences in trends between geographic subdivisions of the same polity. But the main area of emphasis in future work on existing data should probably be on individual-level analyses examining the interaction of factors in accidents and injuries. This may involve recoding from existing files. For example, NIAAA's Alcohol Epidemiology Data System has analysed differential involvement of Indian tribal groups in fatal alcohol-related accidents by matching a Fatal Accident Reporting System (FARS) file with a death-certificate file. Work is particularly needed on non-traffic accidents, since there is a tremendous imbalance between the available data and knowledge of traffic and non-traffic accidents.

B. Improving the Handling of the Alcohol Dimension in Casualty Reporting

1. *Developing and diffusing technology for determination of body-fluid alcohol content*

The requirements of such technology, in the context of developing countries, are that the methods be simple and cheap, yield quick readings, and withstand extreme climates and rough handling.

In many developed countries, as noted above, the development and use of technology for blood-alcohol determination was of crucial policy significance. The picture of alcohol's role in traffic fatalities that emerged from blood-alcohol measurements was a critical factor in creating the will to undertake effective prevention measures.

Alcohol determination in the context of an emergency hospital or primary care clinic has three different motivations: (1) it can be helpful in diagnosis and in terms of therapeutic indications for the individual case (i.e., to check whether it is drunkenness or a coma, to adopt procedures in the presence of a central nervous system depressant, etc.); (2) it can have forensic significance, bearing on the criminal responsibility and civil liability of the patient or another party, particularly if a blood alcohol level standard is set forth in law; and (3) it can contribute data to epidemiological studies, reporting-system statistics, and policy studies.

From the point of view of the first and third motivations, a highly valid BAL reading is not very important--a rough measure may be almost as good. On the other hand, for forensic purposes, exact validity is often crucial (more than half the time at workshops for American lawyers defending drunk driving charges is devoted to how to attack the validity of the BAL reading). However, the possibility of forensic use is a hindrance to the use of alcohol determination devices for the other two motivations. That a diagnostic test may result in harm to the patient is not only a matter of ethical concern, but also a concern of health workers in that they may be required to spend time as legal witnesses. For these reasons, a somewhat imprecise measurement system--sensitive to the presence of alcohol, but with only a rough measurement of the BAL level--may actually be an advantage from therapeutic, research, and policy standpoints.

2. *Developing and instituting an alcohol dimension in the injury codes of ICD*

The 9th revision of the ICD offers two separate codings for "injuries, poisonings and violence," according to the nature of the condition (Chapter 17) and according to the "environmental events, circumstances and conditions" which were "the cause of injury, poisoning, and other adverse effects" (the "E-codes"). Priority is given to the E-codes if only one cause of death is to be tabulated, in accordance with the general priority for the underlying cause and the rule that "the

underlying cause of death is (a) the disease or injury which initiated the train of events leading directly to death, or (b) the circumstances of the accident or violence which produced the fatal injury."

Despite this general framework, there is no provision in the ICD for recording the involvement of drunkenness as a "circumstance ... which produced the fatal injury" except for poisonings (980.0 and E860.0). There is perhaps no single step that could be taken with more potential for improving our knowledge of and monitoring of alcohol's role in casualties in every country than to institute a workable way of recording the alcohol dimension in casualties in the 10th revision of the ICD, which is moving slowly towards completion and adoption in the next few years. If it is agreed that it would be desirable to include a means for recording the alcohol dimension in injuries in ICD-10, setting up a process for developing and recommending such a means is an urgent priority.

3. Pilot studies in improving alcohol reporting in casualty reporting systems

Typically, a reporting system is built up from forms that are filled out as part of their daily duties by workers with a particular set of functions in a particular kind of health and social agency or practice. A police officer on traffic duty, for instance, may have the responsibility of filling out the report forms for an accident to which he or she is assigned. An intake worker at an emergency department may be responsible for filling out an intake form that functions also as the record for a reporting system. A doctor in private practice may be legally obligated to fill out a report for certain kinds of illnesses when a case comes to his or her attention. For many such workers, the reporting-system form is often seen as a piece of "bureaucracy," a formal obligation that has nothing to do with and may get in the way of their "real work." Pressure from those filling out the forms to keep them brief is thus always intense, and there may be little incentive to be precise or complete in filling them out.

The reporting system also includes a process of transmission, translation, and aggregation of these individual forms. Typically, they are sent to a central office, coded or checked and entered onto a data-processing file, and tabulated. At each of the steps of this process, there are chances for error and for reinterpretation. A study of the operations of a casualty reporting system thus includes a study, in some ethnographic detail, of what actually goes on at the "front line" where reports are filled out, and a study of the processes by which the raw data are accumulated and processed.

There have been three main ways in which alcohol aspects have entered into reporting systems. One traditional aspect is the determination by a responsible party that the person in question "had been drinking" at the time of the casualty event, usually as a dichotomous determination. An elaboration of this, which has been shown to be quite accurate as applied by Finnish emergency-service doctors,

is a four-category determination based on behavioral as well as physiological indicators. It may be especially suited to cultures that are sensitive to alcohol issues and where drunkenness behavior is traditionally demonstrative. It would be an interesting pilot study to try to apply the method, say, in Italian emergency services. In the U.S., the highway patrol officer's checking of the box "had been drinking" on the accident report form was traditionally seen as underestimating alcohol involvement, although sensitization to the alcohol issue in recent years may have brought about a change.

A second alcohol aspect, also reflecting drinking in and around the event, is the measurement of body-fluid alcohol, through a breath or blood test or other means. As implied above, technological advances make this measurement easily and cheaply available and accurate to a degree adequate for epidemiological studies (although an accuracy suitable for forensic use is more cumbersome). In many countries, pilot studies could usefully be undertaken in introducing the routine measurements of BAL into casualty reporting systems. Such routine use is still uncommon particularly for non-traffic casualties.

The third alcohol aspect is the individual's drinking history, usually ascertained from relatives or acquaintances or inferred from lifestyle. This aspect is primarily collected in connection with mortality recording (and usually for death from illness rather than accident). There appears to have been little attempt to use short questionnaires or screening measures concerning drinking habits or problems in connection with reporting systems, although the use of such measures in general health screening contexts suggests that it might be feasible.

The utility of reporting-system data for the management and prevention of alcohol-related casualties depends first on a systematic measurement of alcohol in the event.

Valuable additions to this would be coding of the event, and some measurement of general drinking patterns. For calibration and for analytical purposes, pilot studies are needed of the interrelations between different aspects of alcohol and the results of different measurement techniques in diverse cultural situations. Contemporaneous studies could be made of the actual functioning of casualty reporting systems, and of possible avenues and mechanisms for improving the measurement of alcohol dimensions. On the basis of these pilot studies, full-fledged demonstration projects could be undertaken to test the integration of new alcohol measures into the regular operating procedures of casualty reporting systems.

C. New Data Collection Studies

1. *Pilot studies: Repeated sampling to monitor alcohol's role in emergency services*

Our knowledge of the extent of alcohol's involvement in casualties derives primarily from two sources--reporting-system statistics and special studies on samples limited by institution, time, and place. Reporting-system statistics have the capability of providing useful data on trends over time, although changes in institutional responses and in reporting practices often leave the interpretation of reported trends questionable. Such systems, however, are typically extremely limited in the information collected on alcohol's involvement. A classic example is the box that can be checked off for "had been drinking" on U.S. highway accident forms. The huge hidden expenditure of institutional resources involved in any elaboration of measurements or improvement in validity in reporting systems makes them an inflexible and costly means of gathering detailed information on alcohol's role in injuries.

A further practical consideration is that, for many emergency response agencies and in many countries, an adequate casualty reporting system does not exist. It is perhaps inefficient and impractical in most circumstances to contemplate setting up a reporting system solely to measure alcohol's role in casualties.

The alternative source of information, special studies carried out in the framework of emergency-service responses to casualties, is the source of almost all of our detailed information on alcohol's role in casualties in different cultures and circumstances--that is, data that reach beyond the reporting of a single figure of the percentage of cases with alcohol involvement. But such studies typically are limited to a particular time and location. It is usually questionable to generalize from them to general national or regional patterns. Their findings reflect the particular circumstances of the institutional frame in which their data are collected--that is, which casualties are brought there and under what circumstances.

Furthermore, usually such studies do not yield data trends over time. From a policy point of view, monitoring of changes over time is a crucial element of the measurement of alcohol's role in casualties. Data over time in given cultural circumstances give vital clues to the means of reducing alcohol-related casualties. With such monitoring, it is possible to measure the effect of policy interventions, or for that matter unanticipated events, on the burden of alcohol-related casualties.

2. *General-population studies of alcohol's role in casualties*

The case for substantial attention to casualties and alcohol's role in them was summarized by Aarens et al. in 1977:

"General population studies of drinking practices and problems have up till the present not emphasized the area of alcohol and serious events... Our review and reanalysis of existing data suggest some puzzles which general-population data can help address. (a) Quite generally, alcohol appears to be particularly involved in the most serious events. For minimal-level casualties, the association with drinking is quite slight. (b) Alcohol seems to show a stronger relation to casualties in studies of samples of events than in studies of samples of people from the general population. These overall findings suggest directions for particular attention: (a) alcohol may contribute not so much to the occurrence of events as to determining how serious their outcomes are; (b) particularly in middle age, heavy drinkers may be a risk of casualties because of a sedentary lifestyle--a barstool may be less hazardous than a ski slope; (c) alcohol may be more implicated in events than in people samples because the events tend to be concentrated among relatively few people, i.e., subsections of the population differentiated in other ways as well as drinking may cumulate series of events. These areas for attention cannot be addressed only with general-population data, but general-population data can test the findings suggested by our review and reanalyses can be used for multi-variate analyses of drinking and serious events controlling for life-style and other risk factors, and can begin to address the important question of how people avoid serious events while drinking. ... The sample needs to be quite large, and a new kind of questionnaire with detailed retrospective coverage of events and their conditions and sequelae needs to be developed."

Such studies become particularly valuable if they are coordinated and can be compared with the emergency agency sample studies outlined above. By asking the general population about recent injury events, say in the last year, and the treatment received for them, an idea can be gained of the "hidden figure" of injuries not treated in emergency agencies, and of alcohol's role in them. Besides the occurrence of accidental injuries, the study should cover victimization by criminal acts and the respondent's associated drinking. The best-established connection of alcohol and crime is drunkenness in the victims of predatory crimes. The respondent's commission of criminal acts and associated drinking should also be covered to the extent possible. The respondent's general drinking patterns and experience of alcohol-related problems should be elicited, as well as drinking and other factors in the casualty events.

3. Multidisciplinary investigations of alcohol's role in accidents

The methodology of multidisciplinary accident investigations, combining engineering, medical, forensic, behavioral, and other expertise to trace the sequence of events and factors involved in an accident, is most highly developed and best

known for airplane crashes. For these rare but dramatic events, frequently involving many passengers, often of high status, it has been taken for granted that effort and expense should not be spared in order to draw lessons for the future. The technique has been only sparingly applied to other, more mundane, casualties, although the methods are equally applicable and the total toll from other casualties is much higher. Over the last 20 years, the techniques have been applied to a series of road traffic crashes in the U.S., although only one such study seems to have paid specific attention to alcohol involvement. On an ad hoc basis, there is now also a series of published U.S. investigations of alcohol-involved train wrecks.

In principle, multidisciplinary accident investigations ask the same kinds of questions and have the same kinds of aims as an official inquiry into a disaster or a coroner's inquest into a death. From a public health policy perspective, the crucial step forward is not so much the involvement of an investigating team with different expertise but rather the cumulation of investigated cases into a register or file, which can then be analysed statistically. It would be interesting to explore the possibility of cumulating such a file on an international basis. Besides the larger numbers available for analysis from such a cumulation, comparing factors and conclusions in different national settings might well bring out hidden factors in the occurrence of casualties. There is probably also a need to emphasize the potential usefulness of measuring alcohol dimensions in the events--not only a measurement of the BAL, but also the location, timing, and pattern of drinking --since the heavy engineering emphasis in many multidisciplinary accident investigations has often resulted in a neglect of "human factors" except as a residual explanation that remained otherwise unexplored.

D. Alcohol, Casualties, and Policy Formation

The connection between alcohol and injuries, and particularly traffic injuries, has been a major focus for alcohol policy-making in many industrialized countries. Often, legislatures, administrations, and courts have found this an area of strong political currents, since it affects relatively powerful interests and social sectors. An important precondition for action has been the accumulation of epidemiological evidence on alcohol's role in casualties, since without the concrete evidence on numbers and proportions it is easy to shrug off the problem as marginal--as a matter of fate or of a few "bad apples" in the society. The recent literature evaluating policy approaches to reducing alcohol-related casualties has emphasized the importance not only of a pragmatic approach in laws and regulations but also of building a base of popular support for legal and regulatory action. In particular, crackdowns on drunk driving seem to have fairly transitory effects in the absence of a substantial shift in popular perceptions towards a repugnance for drinking and driving.

Projects to improve public health policy-making on alcohol-related casualties, therefore, might be oriented in several directions.

1. Inventories might be compiled of policy measures taken with respect to alcohol's role in particular casualties, and of the available evidence on their effectiveness. A good deal of work has already been done in this area for road traffic casualties. But there has been very little cumulation of work in other areas. Examples of areas where there has been substantial recent concern in several countries, including some policy initiatives, which might form the base for new inventories, are alcohol in boating and swimming casualties, and alcohol-related injuries in sports arenas.
2. Studies might be undertaken of the formation of public opinion and consciousness around alcohol's role in casualties, and projects undertaken to change opinion and consciousness. Frequently, such projects will involve working with mass media professionals, for instance to improve the reporting of alcohol involvement in the routine reporting of traffic crashes, and forming alliances with community groups and voluntary organizations. Such projects might fit within the framework of the World Health Organization (WHO) project on "The Assessment of Health Promotion Approaches to the Prevention of Alcohol-Related Problems" (MNH/PAD/85.7).
3. As implied above, the collection, analysis, and publication of data on alcohol's role in casualties must be seen in itself as building a base for new policy-making.

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Plans for Future Work

Single, E., Morgan, P., and de Lint, J. (Eds.) 1981 *Alcohol, Society, and the State: Volume 2. A Comparative Study of Alcohol Control*. Toronto: Addiction Research Foundation.

Reports of Workshops and Working Groups

WORKSHOP 1:	AVAILABILITY, CONSUMPTION, AND TRENDS IN CASUALTIES*
COORDINATOR:	Esa Österberg
PARTICIPANTS:	Roberta Ferrence (rapporteur), Norman Giesbrecht, Jacek Morawski, Jacek Moskalewicz, Robyn Norton, Kai Pernanen
PROJECT TOPIC:	The impact of major changes in alcohol consumption on alcohol-related casualties and social problems.

BACKGROUND

During the last decades there has been a growing interest in the effects of changes in per capita alcohol consumption on the health of populations. This interest has been stimulated by the discovery of regularities in the distribution of alcohol consumption that imply that there is a connection between the total consumption of alcoholic beverages in the population and the prevalence of prolonged heavy alcohol use (Ledermann, 1956, 1964; Bruun et al., 1975; Skog, 1985). It is also a well-known fact that alcohol intoxication plays a significant role in the chain of events resulting in violent deaths. In many types of accidents the causal role of alcohol is reasonably well understood as being due to inhibitory effects on perceptual and motoric skills. In other types of violent deaths, such as suicide and homicide, the causal role of alcohol is much more complex. Nevertheless, it is generally agreed that alcohol is frequently involved in the latter types of violent death as well.

So far the attention in alcohol research has mostly been focused on the relationship between heavy alcohol use and chronic diseases, such as cirrhosis of the liver. In fact, the empirical evidence for the relationship between per capita alcohol consumption and the prevalence of chronic diseases is still very much limited to cirrhosis of the liver and esophageal cancer. There is also suggestive evidence of co-variation of total alcohol consumption and general mortality when the latter is taken as the excess of male over female mortality in the middle age range (Bruun et al., 1975).

The aggregate relationship between per capita alcohol consumption and violent deaths and social problems, such as violent crimes, has not received very

*This is a revised version of the Workshop 1 report.

much attention at the population level. However, in many countries the number of alcohol-related violent deaths may be larger than the number of alcohol-related deaths from diseases. Therefore, the relation between changes in per capita alcohol consumption and health and social consequences of acute intoxication should be more closely investigated.

RATIONALE

There are studies that show a positive relationship between overall alcohol intake and casualties and social problems (Mäkelä, 1978). Most casualties and social consequences of acute intoxication, however, are probably more closely related to drinking patterns and the contexts of drinking than to the total alcohol consumption. Therefore, cross-cultural comparisons may show no relationship at all between per capita alcohol consumption and casualties and social problems.

Studies of sudden changes in alcohol consumption provide an opportunity to study the impact of such changes on casualties and social problems because in the short run patterns of drinking and the context of drinking are quite resistant to change. Moreover, sudden changes in alcohol consumption are often results of actions planned and implemented by government. Therefore, studies of sudden changes have great relevance from an alcohol policy perspective. Furthermore, studying sudden changes may be of particular interest to developing countries that lack the possibility of doing longitudinal or time-series studies because of the absence of the necessary data.

OUTCOME

The expected outcome of the project is a published volume that would present a series of case studies. These may involve the analysis of existing data or the collection of new data. The volume will also review existing literature on studies of major changes in alcohol consumption in different countries and jurisdictions, and provide guidelines and suggestions for methods of data collection for those who may wish to monitor natural experiments. (See Proposed Table of Contents, below.)

Whenever feasible, the outcome measure will include those casualties most sensitive to the drinking patterns of heavy consumers.

Particular attention will be paid to the differential impact of changes on specific age, sex, and other demographic and social subgroups. A range of casualties will be used as the dependent variable, and an effort will be made to determine those casualties most sensitive to changes in alcohol consumption for particular subgroups and in different countries.

VARIABLES

Independent variables:

Per capita alcohol consumption

Legislative changes

- drinking age
- taxation
- types of outlets, location, hours
- prohibition, partial bans as on specific beverages
- curfews
- rationing

Economic

- pricing
- strikes, lockouts
- changes in manufacturing sector
- introduction of new beverages

Social

- religious influence
- major political changes

Dependent variables:

- mortality data
- deaths from injuries (alcohol poisonings, traffic accidents, falls, burns, drownings)
- intentional deaths (homicides, suicides)
- morbidity data (traffic accidents, attempted suicides)
- criminal offences (arrests for drunkenness, drunken driving, crimes of violence)
- other data on societal reactions

PROPOSED TABLE OF CONTENTS

The Impact of Major Changes in the Availability of Alcohol on Casualties and Social Problems

1. Introduction

- Background and rationale

Plans for Future Work

2. Literature reviews

- Review of studies of natural experiments involving alcohol-related traffic accidents
- Review of studies on major changes in alcohol consumption
- Review of strike studies

3. Case studies of the impact of sudden changes in alcohol consumption on alcohol-related casualties and social problems

- About 10 cases dealing with both increasing and decreasing consumption

4. Summary and implications for alcohol policy

Appendix: Implication for alcohol research and guidelines for monitoring natural experiments to examine the impact of sudden changes in alcohol consumption on casualties and social problems

FUTURE PLANS

An announcement of this project has been developed and distributed by the project coordinators (Esa Österberg, Norman Giesbrecht, and Jacek Moskalewicz). Persons interested in finding out more about the project should contact:

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WORKSHOP 2: STUDIES OF CASUALTY AND EMERGENCY SERVICE FUNCTIONING AND IMPROVEMENTS NECESSARY FOR THE HANDLING OF THE ALCOHOL DIMENSION IN CASUALTY REPORTING SYSTEMS

COORDINATOR: Alan Haworth

PARTICIPANTS: Sherrie Aitkin, Peter Diggory, Honey Fisher, El Tigani Hammad, Thomas Harford, Bhushan Kapur, Louis Molamu, Kari Poikolainen, Judy Roizen, John Saunders, Jacques Weill (rapporteur)

OBJECTIVES AND RATIONALE

It was agreed that the task of the group was to draft a project proposal in very broad terms with the following objective: the improvement of the collection of information on the "alcohol component" among emergency room patients. The project would also aim at improving the clinical management of individual patients, as well as generating epidemiological data that might be used for research or internationally comparative surveys.

The rationale for conducting such a project would be presented in a more detailed proposal but would include the present inadequacy of casualty data in many countries and the almost total neglect of the alcohol component. Guidelines for the project could be prepared by an individual (perhaps corresponding with others who are interested) for adoption by individual investigators to be carried out as pilot projects within specific countries, but with the possibility of international collaboration. The object of such pilot projects would be to demonstrate the value of improved recording systems in the institutions and countries where the individual projects had been carried out.

PROPOSED METHODOLOGY

The projects would be carried out in emergency rooms but might also be extended to health centres or similar facilities. An initial assessment of current practices would need to be made with emphasis upon documentation (the use of special forms for record keeping, retrieval of records, record linkage, adequacy of information contained, etc.) and the operation of the emergency service being studied. This would include examination of referral system, registration of patients, workload, means of carrying out special investigations, links with other agencies, and further referrals.

Since it would not be necessary for solely physicians to be recording relevant data, an assessment should be made as to what information might best be recorded by whom.

It was proposed that in this pilot phase, *all* patients arriving at the emergency room with a new complaint should be included. However, depending upon known drinking habits, children and possibly other categories of patients would not be included.

It was proposed that guidelines be prepared on collecting useful basic information. In general, this should be collected on the patient's record normally used in the emergency room. One way of doing this may initially be to use a rubber stamp with the relevant questions.

The following items of information were classified as essential and recommended:

1. A blood alcohol concentration (BAC) level, preferably by the dipstick method, should be obtained.
2. An assessment of state of intoxication on a simple scale. Various methods of BAC assessment are possible such as a brief symptoms checklist, simple global assessments, or scale described in Poikolainen's paper for this symposium.
3. An inquiry should be made as to whether alcohol had been taken within the previous 24 hours and, if so, when the last drink was taken. If possible, an estimate of the amount taken should be obtained.

The following questions are not to be considered obligatory but are to be recommended by casualty workers:

4. Two basic questions on drinking history may be asked: 1) usual frequency of drinking and 2) usual amount taken.

Other nonobligatory questions might concern consumption of drugs.

5. It was recommended that details of the disposal of the patient be noted, especially in cases where an alcohol-related problem might have been revealed.
6. Patient diagnosis should include information on the nature of the event leading to the consultation, the place where the event occurred, the time of the event, and whether anyone else was involved.
7. If possible, note should be taken of previous attendance at the unit or medical service.

PROCEDURE

After the initial evaluation of the functioning of the emergency service, special care should be taken in briefing the staff on the project and in explaining clearly its objectives. The period over which data will be collected will depend upon the actual number of patients being dealt with but should include all representative time periods (if not on a continuous basis). The views of staff should be elicited at all stages of the project on the ease of gathering and recording information, etc. It is recommended that analysis of data be carried out within the participating countries. The results of the analyses should be made available to participating emergency room staffs and administration.

GENERAL COMMENTS

1. If participants in the project are encouraged to follow a standard set of guidelines very closely, the possibility of gathering comparative data will be enhanced. However, it is recognized that in some countries there may be special constraints on how the questions are asked.
2. It may be possible to encourage the recording of diagnoses in terms of ICD codes with possible "experimental modifications."

POSTSCRIPT

The reports from Workshops 2 and 3 have been developed into proposals by the coordinators and a combined version has been drafted by Robin Room and others. For more information please contact:

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1211 Geneva 27
Switzerland

WORKSHOP 3: PILOT STUDIES OF REPEATED SAMPLING METHODS FOR DOCUMENTING TRENDS IN ALCOHOL'S INVOLVEMENT IN CASUALTIES

COORDINATOR: Robin Room

PARTICIPANTS: Sally Casswell, Juan Fernández, René González, Jan de Lint, John Macdonald, Enrique Madrigal, Maria Elena Medina Mora, Richard Müller (rapporteur), Laure Papoz, Alfredo Pemjean, Joan Rodés, Haydeé Rosovsky, Cheryl Stephens, Leland Towle

ULTIMATE GOAL OF THE STUDY: To establish useful monitoring systems for alcohol-related casualties according to the specific needs of countries.

BASIC METHODOLOGY

1. Sample of the patient load of emergency health services focusing on injuries. Countries would be invited to also include medical conditions and other types of institutions.
2. Two-phase procedure:
 - a) Pretest to develop methods and instruments; and
 - b) Main study to generalize to the whole country.

BASIC CRITERIA FOR DEVELOPING MEANINGFUL DATA PROJECTS

1. Usefulness for each country;
2. Simplicity of data collection and standardized data analysis;
3. Transferability of knowledge; and
4. Minimal standardization of data to provide the possibility of international comparison.

Criteria for Usefulness

Data should be useful in terms of the following: planning purposes (data on trends over time are of particular interest), the medical management of alcohol-related casualties, and medical education (professional and paraprofessional).

Criteria for Simplicity.

Simplicity refers to:

1. content of data collection or alcohol measurement,
2. sampling method, and
3. field work method.

1. *Content*

Three types of information have to be collected: a) patient data; b) institutional information; and c) information on other individuals involved in the casualty.

a. Patient data

The following minimal requirements have been identified:

- i. The application of the dipstick or other, at least semi-quantitative, BAL measures;
- ii. Nature of injury or medical condition;
- iii. Type of event and alcohol involvement; and
- iv. Demographic background data. (In part, this information is provided by the standard medical record or information sheets used in emergency rooms.)

If possible the following data should also be reported:

- v. History of drinking; trauma; and drinking and trauma; and
 - vi. Other psychoactive drugs involved.
- b. Institutional data should include:
- i. A basic description of the caseload;
 - ii. A documentation of how emergency rooms operate; and

- iii. A description of the institutional context of emergency rooms (i.e., how one deals with casualties in a given country).
- c. Information on the drinking of other individuals involved in the casualty event should be reported (e.g., violence).

2. *Sampling Method*

- a. Pretest
 - i. Arbitrary selection of one or two institutions easily accessible (urban) and willing to cooperate; and
 - ii. Systematic selection of a maximum of 500 cases adequately distributed over time (time, day, week) with a minimum age limit of 14 years.
- b. Main Study

The first step would be to prepare an inventory and typology (e.g., urban, rural) of emergency institutions (and if included, of other institutions).

A two-stage sample was proposed:

- i. A systematic selection of institutions according to relevant criteria (e.g., types of institutions); and
- ii. A systematic selection of a minimum of 2,000 cases, adequately distributed over time (time, day, week) with a minimum age limit of 14 years. Institutions would be sampled disproportionately according to caseload, with samples being weighted when data are generalized to the entire country.

3. *Field Work Method*

Field work methods to be developed have to take into account the countries' specificities. It is advisable to have data collected by various staff (medical, nursing students, etc.) and that special attention be given to minimizing the non-response rate. In the case of seriously injured persons, one should at least obtain data on alcohol involvement and, if possible, reports from witnesses should be included.

Transferability of Knowledge

This requires the exchange of expertise from one country to another. A pairwise cooperation of developed and developing countries should be taken into consideration.

Comparability of Data

As the nature of data needed in each country varies considerably, comparability is difficult to obtain. It should, however, be kept in mind that the study design involves comparisons of institutions and not of countries, and, therefore, it is expected that comparability would be easier to obtain.

ANALYSIS OF DATA

Participating countries should be willing to utilize a standardized scheme for primary simple data analysis.

TIME REQUIRED

- | | | |
|----------------|----|-----------------------------------------------------------|
| Pretest Study: | 1. | Design, development of methods and instruments--1/2 year. |
| | 2. | Data collection and basic analysis--1 year. |
| Main Study: | 1. | Design, sampling, data collection--1 year. |
| | 2. | Analysis and report--1/2 year. |

PARTICIPATION

All of the participants in the group showed considerable interest in taking part in the study. If a country has already done a substantial part of the pretest, its repetition is not required.

COMPLEMENTARY STUDIES

1. *General Population Studies*

It is generally agreed that cases in emergency rooms represent only the "tip of the iceberg" of the problem. Countries should, therefore, be encouraged to collect data on casualties in addition to emergency room experience, by including the corresponding questions in their general health and drinking surveys.

2. *Multidisciplinary Case Studies*

Countries should be encouraged to carry out multidisciplinary case studies on alcohol-related casualties. Such on-the-scene investigations could provide a deeper insight into the systematic character of the casualty process and additionally indicate the relevance of factors other than alcohol involvement in casualties.

POSTSCRIPT

The reports from Workshops 2 and 3 have been developed into proposals by the coordinators, and a combined version has been drafted by Robin Room and others. For more information please contact:

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WORKSHOP 4: INVESTIGATIONS INTO THE APPLICABILITY OF ALCOHOL CASUALTY RESEARCH TOWARD POLICY FORMATION

COORDINATOR: Marcus Grant

PARTICIPANTS: Manuella Adrian, Susan Farrell, Gilles Forget, David Hawks, Harold Holder, A.E. Odejide, Irving Rootman, Ignacy Wald, Reginald Warren (rapporteur)

POLICY MEASURES TO ENHANCE THE QUALITY OF RESEARCH

The participants in this workshop recommended that medical bodies and other related institutions and practitioners be encouraged to obtain information on alcohol use as a standard part of procedures relating to admission and treatment of casualties.

It was also recommended that participants of the symposium research and report on the conditions governing the confidentiality of information obtained in the conduct of research studies, in particular as this relates to the question of legal liability and the use of such information in criminal or civil proceedings.

There was agreement that health education programs should include instruction on alcohol-related problems in their curricula at the level of medical, nursing, and paramedic training. These procedures should inculcate a community-oriented problem-based learning approach. This paves the way for a generation of alcohol-problem-sensitive health professionals and citizens.

At the same time, it is desirable that all studies in alcohol-related casualties be made readily available to educators in the health field, as well as to those professionals and paraprofessionals in charge of emergency rooms or similar services in order that contributions in this area may include educational, preventive, and service programs.

MEASURES TO ENHANCE THE POLICY RELEVANCE OF RESEARCH

The workshop participants recommended that wherever feasible, collaborative studies incorporate estimation of the direct health care costs of alcohol-related casualties. In particular, simple costing exercises should be applied to treatment services for casualties.

Efforts should be made to improve the quality of information available on the consumption of non-commercially produced alcoholic beverages and their relation to casualties within the context of ongoing studies. Special attention should be given to concentration of alcohol, additives, congeners, and chemical impurities

and the clinical effects of these substances. In addition, efforts should also be made to improve the information on the ingredients of commercially produced alcoholic beverages, and to make this information available to the general public.

It was recommended, also, that research efforts be extended to take greater account of the associated economic, social, and cultural circumstances surrounding alcohol involvement in casualties.

SPECIFIC PROJECTS RELEVANT TO POLICY

It was proposed that a review be produced consisting of a comparative analysis of evidence presented at this meeting that assesses the magnitude of the problem of alcohol and casualties in selected participating jurisdictions, and considers the policy implications arising from this assessment.

The group also recommended that a review be conducted of the policy formulation processes underlying the introduction of selected policy measures in the area of alcohol and casualties. This review should draw on key informant methods and be conducted in selected countries.

The members of this workshop encouraged the development of research proposals to study the perceptions of alcohol-related casualties and associated policy measures by policy-makers and the public.

WORKING GROUP 1: CONDITIONS FOR INFERRING CONTRIBUTORY CAUSE OF CASUALTIES TO ALCOHOL

COORDINATORS: Harold Holder and Kai Pernanen

PREAMBLE

different types of casualties will involve different types of causal processes. Therefore, the concrete criteria (involving different independent and intervening variables) for accepting some form of causal linkage (or contributory role) between alcohol and one type of casualty may be different from those used in connection with another type of casualty. For example, the pharmacological evidence relevant to a causal accounting of a relationship between alcohol and casualties from violence may be at least partly different from the evidence relevant to the connection between alcohol and falls.

The referents of the label "alcohol" are many. For any type of causal accounting, a statistical link between alcohol use and a type of casualty will have to be specified. The minimum distinction to be kept in mind and propagated is that there are many intervening experiences and factors between (1) "alcohol" on the aggregate level (per capita consumption or alcohol availability) and (2) alcohol intake that refers to the effects (pharmacological, psychomotor, psychological, etc.) of ingesting alcohol, are many intervening experiences and factors.

"Cause" is a formal concept tied definitionally in practice to a set of research procedures independent of the empirical nature of the independent and dependent variables. It can also be applied to aggregate-level research and findings. This means that alcohol use in the aggregate (e.g., alcohol availability) can be shown to have a causal effect on casualty rates if the conditions listed below are fulfilled. The greater the number of conditions fulfilled, the stronger the inference of causality.

Given the indeterminateness of the intervening processes between the aggregate and the individual level of "alcohol use," it is logically possible that a causal connection exists between alcohol on the aggregate level and rates of some casualties independent of any effects that alcohol intake (on the individual level) may have. In all probability, processes on both levels are involved in any non-random relationship between different levels of alcohol use and different types of casualties. The following conditions are meant to apply to both individual and aggregated levels of independent and dependent variables.

REQUIREMENTS FOR INFERRING CONTRIBUTORY ROLE OR "CAUSE"

1. An association between alcohol and problem events and/or condition has been shown, controlling for other potentially confounding factors.

2. The behavior responsible for the problem event and/or condition is consistent with the known pharmacological effects of alcohol.
3. A demonstrated dose-response relationship exists and holds across various jurisdictions and over time.
4. Alcohol use or changes in rate of consumption precedes the problem event or changes in the rates of problem events. This is a necessary condition.
5. The increased likelihood of a problem event when alcohol has been consumed or rate of consumption increases is confirmed in different types of studies. Note: the more different types of studies (e.g., experimental, correlational, natural processes, natural experiments), the stronger the evidence for a causal relationship.
6. There is a lack of validated evidence to refute the claims.

This group recommended that collaborative studies on casualties should include at least one of the following:

1. Natural history of casualty events;
2. Natural experiments;
3. Modelling across jurisdictions or cultures (including conceptual and computer modelling);
4. Dose response studies; or
5. Selected experimental and quasi-experimental studies.

WORKING GROUP 2: INTERNATIONAL CLASSIFICATION OF DISEASES (ICD-10): INTOXICATION AND INJURY CODES

COORDINATOR: Robin Room

The participants of the symposium agreed that a crucial precondition for better documenting, monitoring, and understanding the role of alcohol intoxication in injuries in many countries of the world was provision within the International Classification of Diseases (ICD) for coding the involvement of intoxication in injuries (other than the poisoning category, which has an alcohol dimension code).

PROPOSALS

1. As a minimal first step, it is proposed that instructions for injury coding in ICD-10 specifically encourage the use of codes for intoxication from alcohol (305.0 or 790.3 in ICD-9) or other drugs as additional codes when they are present.
2. As a further step, it is proposed that specific provision be made within the injury codes in ICD-10 for coding intoxication from alcohol or other drugs. There are several alternatives for such coding:
 - a. using the fourth or fifth digit to indicate intoxication from alcohol or other drugs; or
 - b. separate three-digit codes in the X,Y,Z series in ICD-10 for alcohol intoxication and for intoxication with other drugs*; or
 - c. extension of the "dagger and asterisk" system or another multiaxial system to the X,Y,Z codes with intoxication (and perhaps other potential proximate causal mental states, such as fatigue) as one dimension, or as a condition to be coded (using the successors to such codes as 305.0) with an asterisk.

The following positive and negative aspects of these methods must be considered:

- a. The first method would entail that data systems and forms be redefined to accommodate additional fourth and fifth digits. Fourth- and fifth-digit information is lost if the physician or statistical tabulating office only uses the classification up to the third digit (as is done in many jurisdictions).

* This alternative was recommended by the symposium participants as the most effective.

Plans for Future Work

- b. The second method is easy to do in terms of data systems set-up. All that would be required would be an additional alphanumeric code. Practitioners and jurisdictions using only three digits would still be able to provide this information, which would be published in three-digit classification statistics. Finally, the present type of ICD system allows E-codes to be present with another principal body system injury code.
- c. The third method provides the most information possible. It was not actively used when it was in effect in previous years.

WORKING GROUP 3: CASUALTY REPORTING SYSTEMS QUESTIONNAIRE

COORDINATOR: Honey Fisher

A working group discussed the Casualty Reporting Systems Questionnaire, which had been distributed to participants prior to the symposium. It was agreed that Sherrie Aitken, Honey Fisher, and Robyn Norton would consider a more in-depth examination of the questionnaires already received to determine whether any more useful quantitative or qualitative information could be retrieved.

The examination, following the symposium, revealed the paucity and inadequacy of existing casualty documentation of alcohol involvement in many of the available systems. Consequently, it was agreed that revision and further circulation of the Casualty Reporting Systems Questionnaire would not contribute any further beneficial information to the state of data collection systems. It was felt that a more potentially valuable exercise would be to add, to the report summarizing the results of the Casualty Reporting Systems Questionnaire, an outline of the range of sources from which data on alcohol-related casualties might be obtained. This could serve as a resource or reference document that might enable governments and organizations to improve existing data collection systems and implement other new systems.

Appendix 1

PROGRAM: INTERNATIONAL SYMPOSIUM ON ALCOHOL-RELATED CASUALTIES

AUGUST 12-16, 1985, GUILD INN, TORONTO, CANADA

MONDAY, AUGUST 12

- 9:00 *Welcome and Introduction*
- Norman Giesbrecht
- 9:15 *Why Focus on Casualties?*
- Presenters: Marcus Grant
 John Macdonald
 Robert Niven
- 10:00 BREAK
- 10:30 *What do We Want to Know?*
- From the Policy-Maker's Perspective:*
- Presenters: Irving Rootman
 David Hawks
- Discussant: Jacek Moskalewicz
- From the Researcher's Perspective:*
- Presenters: Richard Müller
 Johannes de Lint
- Discussant: Ignacy Wald
- 12:00 LUNCH

Appendices

MONDAY, AUGUST 12 (continued)

1:00 *Overview of Research Literature: Developed and Developing Countries*

Presenters: Judy Roizen
 Alan Haworth
 Sally Casswell
 Maria Elena Medina Mora

Discussant: Norman Giesbrecht

3:00 BREAK

3:30 *Causal Inferences on Alcohol's Role in Casualties*

Presenter: Kai Pernanen

Discussant: Harold Holder

4:30 *Summary and General Discussion*

Introduction: Robin Room

TUESDAY, AUGUST 13

9:00 *Alcohol Determination in Casualties*

Presenters: Bhushan Kapur
 Juan Fernández
 Cheryl Stephens

Discussant: Kari Poikolainen

10:30 BREAK

11:00 *Cultural and Demographic Differences in Alcohol and Casualties*

Presenters: Esa Österberg
 Roberta Ferrence
 Thomas Harford

Discussant: Peter Diggory

12:30 LUNCH

2:00 *Models for Future Work*

Presenter: Robin Room

Panel: Maria Elena Medina Mora
 Richard Müller
 Irving Rootman

3:00 BREAK

TUESDAY, AUGUST 13 (continued)

3:30

Workshops

1. *Analysis of Existing Data and International Studies on Statistical Trends*

Coordinator: Esa Österberg

2. *Studies of Casualty and Emergency Service Functioning and Improvements Necessary for the Handling of the Alcohol Dimension in Casualty Reporting Systems*

Coordinator: Alan Haworth

3. *Pilot Studies of Repeated Sampling Methods for Documenting Trends in Alcohol's Involvement in Casualties*

Coordinator: Robin Room

4. *Investigations into the Applicability of Alcohol Casualty Research Toward Policy Formation*

Coordinator: Marcus Grant

Appendices

WEDNESDAY, AUGUST 14

9:00 *Emergency Room Studies of Alcohol and Casualties*

Presenters: Juan Rodés
 Enrique Madrigal
 Alfredo Pemjean

Discussant: Cheryl Stephens

10:30 BREAK

11:00 *Assessing Alcohol-Related Casualties in Different Jurisdictions (1)*

Presenters: Kari Poikolainen
 Robyn Norton
 A.E. Odejide
 John Saunders

Discussant: Roberta Ferrence

12:30 LUNCH

AFTERNOON FREE

THURSDAY, AUGUST 15

9:00 *Assessing Alcohol-Related Casualties in Different Jurisdictions (2)*

Presenters: Jacek Morawski
 Harold Holder
 Haydeé Rosovsky

Discussant: Carolyn Nutter

10:30 BREAK

11:00 *The Scope and Quality of Aggregated Data on Alcohol-Related Casualties*

Presenters: Sherrie Aitken
 Manuella Adrian
 Honey Fisher

Discussant: Reginald Warren

12:30 LUNCH

2:00 *Workshops (Continued)*

1. *Analysis of Existing Data and International Studies of Statistical Trends*

Coordinator: Esa Österberg

2. *Studies of Casualty and Emergency Service Functioning and Improvements Necessary for the Handling of the Alcohol Dimension in Casualty Reporting Systems*

Coordinator: Alan Haworth

THURSDAY, AUGUST 15 (continued)

3. *Pilot Studies of Repeated Sampling Methods for Documenting Trends in Alcohol's Involvement in Casualties*

Coordinator: Robin Room

4. *Investigations into the Applicability of Alcohol Casualty Research Toward Policy Formation*

Coordinator: Marcus Grant

Appendices

FRIDAY, AUGUST 16

9:00 *Assessing Alcohol-Related Casualties in Different Jurisdictions (3)*

Presenters: El Tigani Hammad
 Laure Papoz
 Jacques Weill
 Norman Giesbrecht

Discussant: Johannes de Lint

10:30 BREAK

11:00 *Reporting Back from Workshops*

12:00 LUNCH

1:00 *Plans, Future Work, Meetings, Publications*

LIST OF CHAIRPERSONS:

Monday:	Leland Towle
Tuesday:	Irving Rootman
Wednesday:	Marcus Grant
Thursday:	René González
Friday:	Robin Room

SOCIAL ACTIVITIES:

SUNDAY, AUGUST 11, 8:30 P.M.
RECEPTION, GUILD INN

FRIDAY, AUGUST 16, 8:00 P.M.
BANQUET, CHELSEA INN

Appendix 2

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